Alaska's Nonpoint Source Water Pollution Control Strategy

ALASKA
Department of
Environmental
Conservation

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1. Introduction

A. Purpose of the Strategy

Alaska's *Nonpoint Source Water Pollution Control Strategy* is a statewide plan for protecting Alaska's natural resources from polluted runoff also known as nonpoint pollution. It is a collaborative effort of a wide range of entities. It identifies existing programs, sets a strategy for implementing these programs, establishes goals, objectives and timelines for completion of tasks, and outlines methods for determining success.

Alaskans depend on clean water. Clean water is critical to our way of life and our health, whether it is used for subsistence, recreational, commercial, domestic or industrial activities. Alaska's generally pristine waters are a distinguishing characteristic that helps make Alaska unique among the states. Maintaining good water quality can only be achieved when all sources of pollution in a watershed are taken into consideration and resources are focused on the highest priorities and people work together to prevent pollution and achieve clean water goals. Nonpoint source water pollution is water pollution which does not come from an end of pipe discharge. It is the leading cause of water pollution in Alaska.

B. Nonpoint Source Pollution in Alaska

Alaska is a relatively undeveloped state, with most of our watersheds currently in pristine condition. However, extensive development is occurring in some areas, particularly in the five major urban hubs; and increasing resource extraction is occurring in some areas. In populated areas, many waterbodies, including important fish streams, have been degraded and are in need of restoration. The emphasis of our nonpoint source pollution strategy is a combination of improving the capacity of local governments to manage nonpoint source pollution combined with the following state prevention, restoration, and stewardship efforts. Watershed management plans will be developed and implemented in high priority watersheds where water quality is either impaired or threatened. Restoration strategies for polluted waters will target the sources of pollution and include measures to control that pollution to prevent future degradation. Restoration activities will be designed to achieve a water quality classification appropriate to the specific waterbody.

1. Organization of the Strategy

The Strategy is a roadmap for how Alaska will meet the challenge of protecting water resources and public health from nonpoint sources of pollution over the next five to fifteen years. The document is arranged into nine sections. The first section describes the purpose of the document, funding sources, and federal regulatory requirements. The second section describes how the state incorporates the Environmental Protection Agency's (EPA) nine key elements of a dynamic and effective nonpoint source

management program and includes the Nonpoint Source Pollution Action Plan with Objectives and Tasks for the next 5-15 years. Sections two through eight delve into the state's strategy to control pollution from primary sources. Identified Management Measures and Indicators for each pollution source are provided to establish measurable outcomes. Applicable regulatory controls for each pollution source are summarized along with key partnerships. Also included in each section is a set of goals for reduction of nonpoint source pollution from each specific pollution source. The Action Plan tables are the basis of the state's strategy to control nonpoint source water pollution from each pollution source.

Pollution Sources with an Action Plan & Objectives

Section 2.0 Urban and Community Development
Section 3.0 Forest Practices
Section 4.0 Harbors and Marinas
Section 5.0 Mining
Section 6.0 Hydromodification
Section 7.0 Agriculture
Section 8.0 Roads, Highways and Bridges

The Appendices to the Strategy provide background and reference material on a number of subjects including the Department of Environmental Conservation (DEC), Water Quality Education Strategy, Information Management Systems, Sources of Funding Assistance, Agencies and Organizations, the Alaska Clean Water Action (ACWA) process, Boat Operation Local Ordinances, and Local Ordinances on Roads, Highways and Bridges.

2. Funding Sources

Communities and local organizations know the problems in their area, but they are often unable to implement such projects because of a lack of knowledge about how to fix problems, and how to provide financial support. With limited funds available and limited discretionary spending, federal, state, and local government programs are rarely able to provide a single primary source of funding. Combined together, these funding sources can result in environmental progress. Appendix E includes a list of possible funding sources.

Federal Funding Sources

The EPA, Office of Water has developed the Catalog of Federal Funding Sources for Watershed Protection to inform watershed partners of federal monies that might be available to fund a variety of watershed protection projects. This web site searchable database EPA's Catalog of Federal Funding Sources for Watershed Protection of financial assistance sources and can be found at: http://cfpub.epa.gov/fedfund/

Performance Partnership Grant
The primary source of state funding for nonpoint source activities and projects is an annual *Performance Partnership Grant (PPG)* administered by EPA that combines funding from a variety of sources authorized in the Clean Water Act (CWA). These include funding from Section 319 Nonpoint Source Control, Section 106 Water Pollution Control, Section 106 Groundwater Protection, and Section 104(b)(3) grants. The Performance Partnership Grant funds require approximately 40% match from non-federal sources, which comes from both state funding and from local sources. The scope of work in the Performance Partnership Grant is negotiated annually with EPA and documented in a *Performance Partnership Agreement (PPA)*. Funding from the *PPG* used to implement the Nonpoint Source Pollution Control Program is allocated into four categories:

- DEC water quality programs;
- Collaborative projects with the Department of Fish and Game (DFG), Department of Natural Resources (DNR), and the University of Alaska;
- Grants to communities for local watershed protection and restoration projects;
- Contracts for highly technical projects.

Municipal Loans for Water and Sanitation Projects
DEC provides loans and engineering support to municipalities for drinking water, wastewater, solid waste, and nonpoint source pollution projects such as waterbody restoration and recovery. Local match requirements depend on a community's population and can include federal funds.

Alaska Clean Water Fund (Revolving Loan Fund)
The Alaska Clean Water Fund and the Alaska Drinking Water Fund provide loans and engineering support for drinking water, wastewater, solid waste and nonpoint source pollution projects, such as waterbody restoration and recovery. These loan programs are designed for cities, boroughs and qualified private utilities. Primary services include:

- Providing low-interest loans up to 20 years in duration for projects or eligible portions of projects.
- Providing refinancing of eligible projects.
- Assigning a project engineer to assist with plans, designs, construction and regulations.
- Assuring timely reimbursement for construction expenditures.
- Ensuring appropriate and effective use of loan funds.

ACWA Grant Funds
In Alaska, multiple federal grant funds are administered through the ACWA initiative. These grant funds are the CWA Section 319 grant funds, the DNR Office of Project Management and Permitting (DNR/OPMP) Alaska Coastal Management Program's Section 309 Enhancement Grants Program and Section 6217 Coastal Nonpoint Source Pollution Program, and DFG's Sustainable Salmon grant funds. This is one of DEC's

primary mechanisms for identification and abatement of nonpoint source water pollution. For Fiscal Year (FY) 2006, ACWA grant priorities focused on providing monies to abate and prevent nonpoint source water pollution from stormwater runoff, on-site disposal systems (OSDS), off-road traffic and forestry operations.

C. Federal Regulatory Requirements

The Coastal Zone Act Reauthorization Amendments (CZARA) Section 6217 requires that state coastal nonpoint programs be closely coordinated with state and local water quality planning and programs under several sections of the CWA including 319. Revised *Alaska Coastal Clean Water Plan* management measures are fully integrated into this update of Alaska's Strategy.

There is no statutory requirement for States to submit upgraded nonpoint source management programs for EPA approval under Section 319 of the CWA. EPA guidance on program revisions encourage each state to review and, as appropriate, revise their nonpoint source management program and submit the upgraded program to EPA for approval. Only EPA-approved programs will be eligible for recognition as an Enhanced Benefits State. EPA NPS Enhanced Benefit States will be afforded substantially reduced oversight and maximum flexibility to implement their State programs and to achieve water quality objectives as described in *"Nonpoint Source Program and Grants Guidance for Fiscal Years 1997 and Future Years (Guidance*, May, 1996)."

Since a revision to the state Nonpoint Source Program is not a statutorily mandated process, it does not require the same steps specified in CWA section 319 for initial program approval. For NPS program upgrades EPA offers to work together to review, revise and implement enhanced State nonpoint source management programs that apply nine key elements for all significant nonpoint sources of pollution.

1. Coastal Zone Management Act, Section 6217

The state's strategies to implement the *Alaska Coastal Clean Water Plan,* Public Review Draft, August 1995, (6217) components are identified in the Action Plan at the end of each nonpoint source management measure section as required under Section 6217. Objectives and tasks are listed in the tables, with a cross reference to Section 6217. These objectives and tasks serve as the 5- 15 year implementation plan for Section 6217.

The majority of Section 6217 management measures are implemented through state programs and authorities in existence, such as: the state certification of federal permits and activities that Water Quality Standards will be met, fish habitat protection, water rights appropriations, the Alaska Coastal and Harbor Design Procedures Manual, Harbor Management Agreements, the Forest Resources and Practices Act and regulations, and erosion and sediment control plans for dam construction. For a complete listing of authorities and programs to implement the Section 6217 management measures, please

refer to the *Alaska Coastal Clean Water Plan* and the agency and organization list in Appendix D.

2. Alaska's Implementation of Strategy Elements

Alaska intends to continue to employ a mix of regulatory and non-regulatory tools to ensure implementation of nonpoint source goals, action plans, objectives and tasks.

D. Statewide Incorporation of EPA's Nine Key Elements

1. The State program contains explicit short and long-term goals, objectives, and strategies to protect surface and ground water.

Alaska's Strategy to curb nonpoint source pollution is implemented through short and long term goals, objectives and tasks for each of seven pollution sources. A completion target date is included for each task.

2. The State strengthens its working partnerships and linkages with appropriate State, Tribal, regional, and local entities (including conservation districts), private sector groups, citizens groups, and Federal agencies.

Improving the coordination and collaboration of water quality initiatives between agencies and organizations is an important part of the Strategy. Reaching consensus on the priority waters that require prevention and restoration will assure limited resources will be used most effectively. The DEC leads coordination efforts to provide consistency in meeting the goals of the Strategy, but it is ultimately the responsibility of everyone to work together to meet water quality needs in Alaska. A detailed description of state agencies, local organizations and a list of federal agencies that are important for partnerships to control nonpoint source pollution are found in Appendix D.

State resource agencies participate in ACWA, a statewide water quality planning process to unite state efforts to protect and restore the quality of Alaska's water resources. The leads in this process are the DEC, Department of Fish and Game (DFG), and Department of Natural Resources (DNR). Through an interagency forum this process identifies Alaskan waters that are polluted or vulnerable to pollution; identifies, prioritizes and schedules clean-up actions; manages and shares information on water quality, water quantity and aquatic habitat; and describes how Alaska will implement best available technology and management practices to prevent pollution.

Implementation of the *Alaska Coastal Clean Water Plan* (6217) required management measures within the coastal zone is accomplished through a partnership of state resource agencies. These agencies include Office of Project Management and Permitting (OPMP) which manages the Alaska Coastal Management Program (ACMP); DEC, the lead water quality agency; DFG, which protects, maintains and improves fish and game and aquatic plant resources; DNR, responsible for oversight of forest practices and dams and habitat protection; and the Department of Transportation and Public Facilities (DOTPF), responsible for construction and maintenance of highways and harbors. Implementation

of nonpoint source management measures in the coastal zone is funded jointly by Clean Water Act (CWA) Section 319 funds and Coastal Zone Management Act Section 6217 funds, as well as other existing programs identified in the *Alaska Coastal Clean Water Plan*.

3. The State uses a balanced approach that emphasizes both State-wide nonpoint source programs and on-the-ground management of individual watersheds where waters are impaired and threatened.

The Statewide approach to management of watersheds has two essential components, combining and balancing: on the ground management through the ACWA Watershed Protection Approach and implementation of the *Water Quality Monitoring and Assessment Strategy* (June 2005) to assure our waters are clean, healthy and available for various uses.

ACWA Watershed Protection Approach

Three departments of the state are involved in assuring Alaska's waters are clean, healthy and available for various uses. The ACWA program brings the State resource agencies, DEC, DFG, and DNR, together to deal with waters in a coordinated, cooperative, and balanced approach assuring state resources are used on the highest priorities. The Department of Fish and Game is concerned about water as fish and wildlife habitat; the Department of Environmental Conservation is responsible for ensuring that state water quality standards are met, to ensure many water uses; and the Department of Natural Resources is in charge of water quantity and administers water rights and withdrawals. ACWA brings these agencies together to assess all aspects of a waterbody, and make joint decisions on assessment and restoration.

ACWA agencies implement a consolidated approach for a complete assessment of the health and status of any particular waterbody. The ACWA process has three major components: 1) Stewardship, 2) Protection and restoration of waters at risk, and 3) Recovery of polluted waters. This process identifies the highest priority water quality and quantity needs to prevent degradation of healthy waters and restore waters that are polluted. This process identifies where citizen, organization and agency efforts should be focused, how best to take action, which agency is responsible for the action, and why water resource protection is important to all Alaskans.

Beginning in March 2003, the ACWA partners pooled funding and resources to create a combined request for proposals. While each agency maintains their own funding, grantees only have to fill out one application to apply for state resource agency grants. Once applications are accepted, they are scored and evaluated for alignment to the ACWA priorities. Agency resources are allocated to those waterbodies with the most pressing needs, and work is carried out to restore, protect, or determine more about them. The ultimate goal is clean water that is fishable, swimmable, workable and drinkable throughout the state.

Additional information on the ACWA process can be found in Appendix E.

Water Quality Monitoring & Assessment Strategy (June 2005)
The DEC, Division of Water, *Water Quality Monitoring and Assessment Strategy* can be found at:
http://www.dec.state.ak.us/water/wqamp/pdfs/monitoring_strategy_final_draft.pdf

This monitoring strategy meets the federal expectations for state water quality stewardship activities enumerated in the CWA in a manner influenced by Alaska's unique needs and challenges. The strategy documents the steps DEC is taking to facilitate the development of information to assess the status and trends of Alaska's water resources and provide water quality information to serve as a basis for environmental and natural resource conditions.

4. The State program (a) abates known water quality impairments from nonpoint source pollution and (b) prevents significant threats to water quality from present and future activities.

Abatement of water quality impairments from nonpoint source pollution in Alaska is accomplished through a combination of Waterbody Recovery Plans and adopted Total Maximum Daily Load documents. Significant threats are prevented from known discharges like dredge and fill activities, stormwater, wastewater discharge facilities and Log Transfer Facilities (LTF) through state authorizations.

Abatement of Known Impairments
Waterbody Recovery Plan – Total Maximum Daily Load
One of the first steps toward the abatement of nonpoint source pollution in an impaired waterbody is the development of the TMDL or Waterbody Recovery Plan. When waterbodies are determined to be impaired (when they exceed state Water Quality Standards for a particular pollutant), they are added to the 303(d) (referring to section 303(d) of the CWA) list of impaired waterbodies which is submitted to the EPA every two years. It is incumbent upon the State and EPA to take the lead in working to restore waterbodies to an unpolluted state. Restoration is accomplished through the development and implementation of either a TMDL document or a Waterbody Recovery Plan. While following different formats, both identify the source of and the means to reduce pollutants and the amount of pollutants that can be introduced to the waterbody while still allowing overall recovery to proceed. With this knowledge, parties who introduce pollutants are given an "allowance," or "total maximum daily load" for that pollutant, and/or prescriptive actions called Best Management Practices (BMPs) that they must follow, to stay within that allowance. Under a Waterbody Recovery Plan, an allowance is not necessarily given but often a range of BMPs are identified to reduce or control the nonpoint source pollution that is impairing the waterbody.

A TMDL or other controls such as a Waterbody Recovery Plan or NPDES permits are required for a polluted waterbody to be removed from the 303(d) list however; a

waterbody can also be removed if there are assurances that pollution controls are in place, or will be in place that result in attainment of Water Quality Standards. These assurances include other pollution recovery plans such as a Waterbody Recovery Plan, Memorandum of Understanding (MOU), Record of Decision (ROD) or a similar type of hazardous substance clean-up approved by DEC's Contaminated Sites Program. These waters are shown in Category 4b (Appendix A) of the Integrated Report. There are also instances where there is no true plan but general assurances that controls are being implemented and only require some follow-up implementation or effectiveness monitoring (as opposed to in-stream monitoring.)

The EPA is required, by court order, to complete at least two of these documents in Alaska, each year. TMDLs and Waterbody Recovery Plans developed by DEC, either directly through staff work or indirectly through contract or grant efforts, are approved by EPA to meet this requirement. EPA may also initiate work on TMDLs or Waterbody Recovery Plans directly, with their staff or contracted efforts. DEC strongly supports the development and implementation of these plans and has committed to completing a minimum of two per year. In FY2003, two were completed; in FY2004, six were completed, four in FY2005, and two in FY2006. Implementation is proceeding on all.

Prevention of Nonpoint Source Pollution from Known Discharges
The Nonpoint Source Program in Alaska places nonpoint source pollution requirements aimed at preventing and abating pollution on log transfer facilities, stormwater, wastewater discharge facilities, and dredge and fill projects on the DEC authorization.

Log Transfer Facilities (LTFs) are permitted either as a state "authorization" for activity covered under a federal (EPA) General Permit, or as a State Individual Permit (for which the applicant must also seek EPA permit coverage). DEC is engaged in three types of stormwater permit activities addressing various industrial sectors and activities common to their business processes and practices to prevent polluted runoff. Wastewater dischargers required to have a permit fall into two general categories: domestic (municipal and private waste treatment plants) and industrial (including mining, oil & gas, seafood processing/hatcheries, utilities and transportation). Dredge and fill projects are required to obtain a DEC 401 Certification which provides "reasonable assurance" that a project will meet state water quality standards, and may require Best Management Practices to be followed concerning fill materials, erosion control, drainage control, and habitat protection.

5. **The State program identifies waters and their watersheds impaired by nonpoint source pollution and identifies important unimpaired waters that are threatened or otherwise at risk. Further, the State establishes a process to progressively address these identified waters by conducting more detailed watershed assessments and developing watershed implementation plans, and then by implementing the plans.**

Polluted or "impaired" waterbodies are identified in the biennial "Integrated Report" submitted by DEC to the EPA. The target for restoration of these waterbodies is at least 10 active restoration projects per year.

Alaska's Final 2006 Integrated report is available at:
http://www.dec.state.ak.us/water/wqsar/waterbody/2004_ir_final.pdf

The Integrated report describes the process by which waterbodies are evaluated to determine if they attain water quality standards or are impaired (polluted). Part of this process includes classifying each waterbody according to five categories, depending on their health; determining which waterbodies need further action; scheduling when each impaired waterbody will be addressed; and then determining how waterbodies are removed from the impaired waterbody list.

6. The State reviews, upgrades, and implements all program components required by section 319(b) of the CWA, and establishes flexible, targeted, and iterative approaches to achieve and maintain beneficial uses of water as expeditiously as practicable. The State programs include:

(a) **A mix of water quality-based and/or technology-based programs designed to achieve and maintain beneficial uses of water; and**
(b) **A mix of regulatory, non-regulatory, financial and technical assistance as needed to achieve and maintain beneficial uses of water as expeditiously as practicable.**
(c) **The State program also incorporates or cross-references existing baseline requirements established by other applicable Federal or State laws to the extent that they are relevant.**

Alaska's strategy to implement nonpoint source program components required by CWA section 319(b) is identified in the Action Plan Objectives and Tasks at the end of each nonpoint source management measure (pollution source) section. The last column of each table cross references the objectives and tasks to Alaska's Coastal Clean Water Plan under Section 6217. These objectives and tasks are a mix of flexible, targeted, iterative approaches that are implemented throughout the state with financial and technical assistance based on the overall goal to maintain beneficial uses of water.

7. The State identifies Federal lands and activities which are not managed consistently with State nonpoint source program objectives. Where appropriate, the State seeks EPA assistance to help resolve issues.

Sections 319(b)(2)(F) and 319 (k) of the CWA Amendments enable states to review federal activities and development projects for consistency with standards in the state's approved Alaska's Nonpoint Source Water Pollution Control Strategy. This provision is a powerful tool allowing states to be involved in controlling the effects of federal activities on water quality. DEC focuses efforts to review federal activities for

consistency with the *Alaska's Nonpoint Source Water Pollution Control Strategy* through the Alaska Coastal Management Program (ACMP) direct federal action reviews, thus affecting the coastal zone. Federal agencies in Alaska with activities that can generate nonpoint source pollution include the Department of Defense, Bureau of Land Management, U.S. Fish and Wildlife Service, National Park Service, Department of Energy, Bureau of Indian Affairs, and the U.S. Forest Service (USFS). Currently many of these agencies are in the process of updating their land management plans last developed in the 1980's. To assure consistent, efficient and adequate nonpoint source measures are included in these plans, DEC develops and submits standard language addressing common stewardship practices to protect and restore waters for consideration and incorporation into federal and state land management plans.

The Coastal Zone Act Reauthorization Amendments (CZARA) of 1990 amended the Coastal Zone Management Act to clarify that federal consistency applies when any federal activity, regardless of location, affects any land or water use or natural resource of the coastal zone. This federal consistency requirement is important since it addresses the need for federal actions to adequately consider state Coastal Management Plans. It is a mandatory but flexible mechanism to resolve potential conflicts between states and federal agencies by fostering early consultation, cooperation, and coordination.

For federal development projects, the elements of *Alaska's Nonpoint Source Water Pollution Control Strategy* constitute the nonpoint source review standards, in combination with DEC statutes, regulations, and procedures that are adopted by reference as standards of the ACMP. In addition, DEC reviews federal development projects and federal permits to determine and ensure their consistency with the standards of the ACMP along with the Forest Resources and Practices Act (FRPA) and regulations, and Section 319 of the CWA. The U.S. Forest Service provides copies of all planning and National Environmental Policy Act (NEPA) documents to the State. For example the State comments on U.S.F. S. Timber sales on the Tongass N.F. under NEPA and Section 319(k) of the CWA.

8. The State manages and implements its nonpoint source program efficiently and effectively, including necessary financial management.

Alaska's Nonpoint Source Water Pollution Program within DEC is the primary program protecting water quality in Alaska's streams and lakes from nonpoint source pollution and restoring polluted waters to a healthier condition by:

- Working with other State agencies to identify water quality needs and priorities for individual waters and statewide stewardship;
- Establishing a schedule and developing TMDLs and recovery plans on polluted waters;
- Implementing TMDLs and Recovery Plans through contracts and ACWA grants to partner agencies, local communities, and others;

- Managing the ACWA Grant Program that addresses priority stewardship, protection and restoration needs on waters throughout Alaska;
- Providing technical assistance to municipalities, local groups, and other state agencies involved in water quality projects;
- Responding to public concerns and complaints on nonpoint source pollution in streams and lakes.
- Managing state and federal nonpoint source funds.

9. The State periodically reviews and evaluates its nonpoint source management program using environmental and functional measures of success, and revises its nonpoint source assessment and its management program at least every five years.

Alaska endorses periodic review and evaluation of the *Alaska's Nonpoint Source Water Pollution Control Strategy*. Every five years the state reviews and upgrades the Strategy. This includes a complete reexamination of the Management Measures and Indicators and Action Plan Objectives & Tasks for each pollution source category that establishes the basis of the state's actions for periods ranging between 5 – 15 years.

Each Action Plan table represents a mix of regulatory, non regulatory, financial and technical tasks that support a specific objective. Management Measures and Indicators are used to assess the state's success in achieving the goals for reduction of each pollution source. They are based on either the states water quality or technology programs designed to achieve and maintain beneficial uses of water.

Table 1. Nonpoint Source Pollution Program (NPS)Action Plan			
Action Plan Objectives & Tasks	**Responsible Agencies & Organizations**	**Timeframe for Completion of Action**	**Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)**
NPS-A. Statewide Water Quality Planning			
NPS-A1. Continue using ACWA to identify Alaskan waters that are vulnerable to pollution; prioritize water bodies that are polluted and schedule clean-up actions; manage and share information on water quality; and describes how Alaska will implement best available technology and management practices to prevent pollution.	DEC, DFG, DNR/OPMP, Local Govts, Coastal Districts, Tribal orgs, NGOs, Fed Agencies, public	On-going	ALL MANAGEMENT MEASURES Additional Measures Critical Coastal Areas Admin. Coordination Public Participation Technical Assistance
NPS-A2 Implement an Alaska Strategy for Water Pollution Education to cover statewide issues.	DEC,DFG, UAF/CES, NGOs	On-going	ALL MANAGEMENT MEASURES
NPS-B. Assess water quality on a statewide basis and in targeted watersheds to support watershed planning and restoration projects to protect water quality and associated uses, including habitat.			
NPS-B1. Develop and maintain a statewide water quality assessment program with tracking and website access to determine polluted waters, sources of pollution, and restoration projects and priorities.	DEC/NPS	On-going	Chap.12 MONITORING, Chap 1 Additional Management Measures Critical Coastal Areas
NPS-B2. For each water identified through the ACWA nomination process, within one year of the nomination collect and review available information to determine if existing stewardship is sufficient or if there are needs for data collection, protection or restoration activities. If further needs exist, use the ACWA ranking process to prioritize the water.	DEC	Ongoing	Chap 1 Additional Management Measures
NPS-B3. For all ACWA high priority waters, within one year after initial prioritization and annually thereafter, evaluate the nonpoint source water quality concerns and develop or modify appropriate actions that should be taken within the next year to help address those concerns, including data gaps that improve the quality of the ranking determination.	DEC	Ongoing	Chap 11 Additional Management Measures

Table 1. Nonpoint Source Pollution Program (NPS)Action Plan			
Action Plan Objectives & Tasks	**Responsible Agencies & Organizations**	**Timeframe for Completion of Action**	**Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)**
NPS-B4. For all ACWA medium priority waters, within three years after initial prioritization and within each three-year period thereafter, evaluate the nonpoint source water quality concerns and develop or modify appropriate actions that should be taken within the next three years to help address those concerns, including data gaps that improve the quality of the ranking determination.	DEC	Ongoing	Chap 11 Additional Management Measures
NPS-B5. For all ACWA low priority and stewardship waters, within five years after initial prioritization and within each five year period thereafter, evaluate any nonpoint source water quality concerns to determine if existing stewardship activities are sufficient. If they are not sufficient, then process the waters through the ACWA ranking process and identify appropriate actions that are needed, including data gaps that improve the quality of the ranking determination.	DEC	Ongoing	Chap 11 Additional Management Measures Chapter 12 Monitoring
NPS-B6. Provide adequate field presence and follow up on complaint response, inspections, and enforcement where necessary to correct water quality violations that are reported.	DEC	On-going	Chap.12 : MONITORING
NPS-C. Complete assessment of fish habitat and passage at culverts on roads and systems, and prioritize sites for protection and restoration.	DFG, DNR/OHMP	2010	Chap. 4: URBAN, VII A, VII B, VII E
NPS-C1. Adopt nutrient criteria for selected categories of high priority water bodies.	DEC/WQS	2010	Chap 11 Critical Coastal Areas
NPS-C2. Complete development of, and publish, biological indicators for each region that include protocols and reference conditions for periphyton and macroinvertebrate communities in wadeable streams that can be used to reliably indicate their biological health.	DEC, UAA ENRI	2010	Chap. 12: MONITORING, Chap 11 Critical Coastal Areas
NPS-C3. TMDLs will be developed for identified waterbodies according to the 10 year schedules established between DEC and EPA.	DEC, EPA, Local Govts	2010	Chap 11 Critical Coastal Areas
NPS-D. Support Water Quality Information Management Systems and Monitoring Efforts			

Table 1. Nonpoint Source Pollution Program (NPS)Action Plan			
Action Plan Objectives & Tasks	**Responsible Agencies & Organizations**	**Timeframe for Completion of Action**	**Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)**
NPS-D1. Use the ACWA database to track and plan actions on all nominated ACWA waters, particularly those needing restoration or that are at risk.	DEC/NPS	Ongoing	Chap.12. Monitoring
NPS-D2. Implement a statewide water quality monitoring strategy to assure that waters reach or maintain their beneficial uses. Provide consistent, long term training for entities monitoring water quality, such as agencies, local governments, businesses, and volunteers.	DEC/NPS	Ongoing	Chap. 12 Monitoring Admin. Coordination
NPS-D3. Review and incorporate monitoring data provided by the regulated industry into an accessible water quality database.	DEC	Ongoing	Chap. 12. Monitoring
NPS- D4. As part of monitoring strategy, develop and implement approach for measuring flows on ACWA priority streams and rivers that may be impaired from nonpoint source pollution.	DEC, DNR, DFG, USGS	2008	Chap 11 Additional Management Measures Chapter 12 Monitoring
NPS–D5.Where appropriate and necessary on ACWA medium or high priority waters, preserve, enhance or establish buffers to ensure water quality meets standards.	DEC	Ongoing	Chapter 12, Monitoring
NPS–D6.For all medium and high priority ACWA waters, evaluate potential for exceedances of petroleum standard for water quality from the exhaust of boat and personal watercraft motors.	DEC	2008	Chapter 12, Monitoring
NPS- D7. For all communities with a population over 500 people, evaluate locations and characteristics of waste disposal sites to determine if impairments to surface water quality exist.	DEC	2009	Chapter 12, Monitoring Chapter 6 Urban and Community Development
NPS-D8.Develop temperature monitoring network on reference streams to establish natural conditions so that long-term measurements of changes from global warming can be established.	DEC	2010	Chapter 12, Monitoring
NPS– D10. Identify, list, assess & map important fish rearing and spawning habitat areas. Make this information available to permitting agencies and other	DFG	Ongoing	

Table 1. Nonpoint Source Pollution Program (NPS)Action Plan			
Action Plan Objectives & Tasks	**Responsible Agencies & Organizations**	**Timeframe for Completion of Action**	**Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)**
interested parties for use in reviewing permit applications & other development activities near waterbodies. Use this information as baseline or reference data for fish habitat monitoring studies.	DNR/OHMP		
NPS–D11. Monitor global nonpoint source pollution reaching Alaska	DEC	Ongoing	
NPS-E. Strengthen partnerships with government and nongovernmental agencies and organizations to improve coordination and efficiency and reduce duplication of effort.			
NPS-E1. Enhance interagency coordination by including resource agencies, education and research institutions, non-government organizations, and public in setting priorities and allocating funding.	DEC	Ongoing	ALL MANAGEMENT MEASURES Admin. Coordination Public Participation
NPS-E2. Identify areas for improved collaboration among agencies and institutions that have expertise in water quality and habitat protection, restoration, education and research	DEC, DNR, DFG, USGS, UA	Ongoing	Admin. Coordination
NPS- E3. Refine standard language addressing common stewardship practices to protect and restore waters for consideration and incorporation into federal and state land management plans.	DEC	2009	ALL MANAGEMENT MEASURES Admin. Coordination
NPS-E4. Strengthen the partnership between the water quality and coastal management programs to implement nonpoint source controls in coastal areas.	DEC, DNR	2010	ALL MANAGEMENT MEASURES Admin. Coordination

Key:
DEC - Department of Environmental Conservation
DEC/NPS - Department of Environmental Conservation/Nonpoint Source Program
DFG - Department of Fish and Game
DEC/WQS - Department of Environmental Conservation/Water Quality Standards Program
DNR - Department of Natural Resources

DNR/OHMP	- Department of Natural Resources/Office of Habitat Management and Permitting
EPA	- U.S. Environmental Protection Agency
NGO	- nongovernmental organizations
UAA/ENRI	- University of Alaska Environment and Natural Resources Institute
UA	- University of Alaska
UAF/CES	- University of Alaska Cooperative Extension Service
USGS	- U.S. Geological Survey

2. Urban & Community Development

Alaska's Population Distribution: The 2004 population estimate for Alaska is 663,661 people (ADLWD, 2005). Major population centers in Alaska are the municipality of Anchorage (pop. 260,283) and surrounding Matanuska-Susitna Borough (pop. 72,278); Fairbanks North Star Borough (pop. 82,840); and City and Borough of Juneau (pop. 30,711) (ADLWD, 2005). The Matanuska-Susitna Borough has been the fastest growing area in Alaska since 1990, growing at an average rate of about 4%. Other areas of Alaska experiencing population growth include the Municipality of Anchorage and the Kenai Peninsula Borough. In Alaska, the military account for about 5.3% of the total workforce, providing nearly as many jobs as the top ten private sector employers combined.

Native Alaskans: There are 227 federally recognized tribes in Alaska (EPA, 2000). The Alaska Native Claims Settlement Act (ANCSA) of 1971 created 12 Alaska Native Regional Corporations (ANRC), which cover the entire state except for the Annette Island Reserve, Alaska's only American Indian reservation. The ANRC's were created to facilitate both the business and nonprofit affairs of Alaska natives. Corporation boundaries were created to include Alaska Natives who share a common heritage and common interests. There are many Native villages facing challenges from growth similar to those in urban areas, including pressure for community expansion along waterways that are critical to subsistence fishing and hunting. The need to manage sewage, solid waste, petroleum products and provide clean, potable drinking water are some of the most important environmental issues facing Alaska's Native villages.

A. Urban Water Pollution

While most of Alaska's waters are remote and presumed to be in pristine condition, many in or near population centers have been impaired. Approximately half of the waterbodies identified by the state in *Alaska's 2006 Integrated Water Quality Monitoring and Assessment Report* as having "persistent" water quality problems are located in urban areas. Historically and for the 2006 Integrated Report, in urban settings (cities, towns, and villages) waters are predominantly impaired from sediment, turbidity, and fecal coliform bacteria contamination from urban and stormwater runoff.

1. Stormwater Runoff

As urbanization occurs, previously vegetated and forested spaces are cleared and developed with impervious surfaces such as rooftops, roads, parking lots and sidewalks and to a lesser degree lawns. This in turn decreases the infiltration capacity of the ground and results in greatly increased volumes of runoff and a change in the surface and subsurface hydrology. The major source of water pollution in Alaska's urban areas is polluted runoff. Sources include stormwater runoff from streets, parking lots, and snow disposal (oil and trace metals), erosion from gravel pits and construction activities (sediments), failing or improperly maintained septic systems (fecal bacteria, excess nutrients), and leachate from landfills (petroleum, metals, dissolved organic and

inorganic chemicals). Fecal coliform, sedimentation, and petroleum are the most common forms of pollution in Alaska's urban areas.

2. Snow Disposal

Alaska municipalities face challenges disposing of more than 100 inches of snow that falls on many maritime cities. Many of Alaska's larger cities have been developed on narrow strips of land between coastal mountain ranges and marine waters. As these land limited cities continue to grow, vacant land that was once used to store snow has been developed into residential and commercial properties. As a result, many Alaskan cities are currently disposing of snow into the marine environment or have contacted DEC about snow disposal options. In order to help DEC respond to inquiries about snow disposal requirements and to assist communities, municipalities and businesses select, prepare and maintain appropriate snow disposal sites the department is developing a Snow Disposal Guidance (2007) policy and procedure.

Snow collected from city streets can contain salt, sand, gravel, suspended solids, dissolved solids, oil, grease, antifreeze, heavy metals, chemicals from tire and engine wear, miscellaneous trash, debris, animal waste and other trace elements from vehicle traffic and automobile engine emissions. Some pollutants become diluted as the snow melts. Other pollutants can accumulate in the area where the snow is dumped or downstream where melt-water accumulates. In addition, the solid materials such as sand and other soil particles, which accumulate in roadway removed snow, act as contaminants by filling in streams, lakes and navigation channels.

A report completed in 2006 titled "Alaska Evaluation of Snow Disposal into Near Shore Marine Environments" presents the results of the evaluation of snow disposal into near shore environments in Anchorage and Juneau. The study examined the results of testing fresh fallen snow collected from roads in Juneau and Anchorage that exhibited a visual sheen, which indicates the presence of oil or grease. These samples showed exceedances of state water quality standards for cadmium, lead, zinc, and mercury (ADEC 2006). These substances are not normally characteristic of freshly fallen snow but are a result of particular land uses related to urbanization and human activities. The study also included an examination of the practice of disposing plowed snow into marine waters, summarized snow removal practices in northern communities internationally and compiled a list of generally used deicers. This report is available at the following web address: http://www.dec.state.ak.us/water/wnpspc/stormwater/adec_snow_disposal_evaluation..htm.pdf

3. Gravel Pit Operation

Gravel pits occur throughout Alaska, and their improper operation can result in water quality impacts and impairment. Several potential pollutants from gravel pits include sediment, turbidity, total metals, and/or petroleum hydrocarbons. An increase in turbidity within a stream environment may result in a potential decrease in available free oxygen necessary to support aquatic life. An increase in the concentration of total suspended

solids, such as silt or decaying plant matter, may destroy water supplies for human, animal, and other wildlife consumption, as well as feeding and nesting habitats by reducing oxygen or increasing temperature. Implementation of erosion prevention controls in a gravel pit can minimize the adverse impacts associated with increased sediment yield. Increased sediments in water can potentially damage fish by abrasion to gills and damage to fish redds, which is a nest of fish eggs covered with gravel, by burying or smothering.

One of the most effective ways to control pollution is the use of Best Management Practices (BMP). BMPs are physical, chemical, structural, and/or managerial techniques to minimize water pollution. The environmental benefits of implementing effective gravel pit BMPs are:
• Reduction of toxic materials that are introduced into the environment by their attachment and transport by sediment particles;
• Less impact on growth and propagation of fish and aquatic life from decreased sediment;
• Protection of receiving waters with designated uses such as recreation and wildlife habitat.

In June 2006, DEC published the "User's Manual Best Management Practices for Gravel Pits and The Protection of Surface Water Quality of Alaska". This manual outlines best management practices (BMPs) for gravel pit operations where stormwater runoff may impact water quality in lakes, rivers, streams, and wetlands. The manual is available at the following web address:
http://www.dec.state.ak.us/water/wnpspc/pdfs/gravelpitbmp_guidance_final_063006.pdf

4. On-site sewage disposal systems (OSDS)

OSDS are common in Alaska's urban and rural communities and are considered by EPA and a growing number of professionals to be a low-cost, long-term wastewater treatment option. However, improperly installed, improperly operated and maintained, or aging OSDS fail to properly treat domestic wastewater and are a primary source of fecal coliform bacteria, biological oxygen demand (BOD), and nutrients such as ammonia-nitrogen. These poorly functioning onsite septic systems can contribute to the contamination of surface water, groundwater, and drinking water and can result in the spread of viral and bacterial illnesses. This may cause costly public health problems and environmental contamination and degradation.

In addition to being properly designed and installed, onsite systems must be operated and maintained to provide treatment that is as good as, or even better than that provided by centralized wastewater treatment plants.

5. Fecal Coliform Bacteria

Fecal coliform bacteria come from the intestines of all warm-blooded animals, including pets and humans. The presence of fecal coliform indicates a potential pathway for other pathogenic organisms that cause human disease. The most frequent sources from human activities are stormwater runoff that contains pet waste, malfunctioning on-site sewage treatment and disposal systems, inadequate wastewater treatment and disposal on vessels in small boat harbors, publicly owned wastewater treatment plants (POTW's), and improper waste disposal. Other potential non human related sources are wildlife and waterfowl.

6. Sedimentation

Soil, particles of plant debris and other particles typically enter waters from natural processes. However, human activities and land uses often tremendously increase the amount of sediment entering waters and cause water quality degradation. Sediments also can carry pollutants and change the characteristics of the stream, lake, or other surface water. The major sources of sediment include runoff from roads, commercial construction projects, housing construction, and commercial developments, gravel pits, snow disposal and streambank erosion.

7. Petroleum

Petroleum products enter surface and groundwater through the exhaust from boat motors, road and parking lot runoff, accidental spills, leaking fuel storage tanks and pipelines, and inadequately constructed or managed landfills.

8. Alteration of Natural Hydrology

Development often alters streams and other waterbodies. Changes to runoff, diversions, channelization, and destruction of natural drainage systems can result in riparian and tidal wetland degradation or destruction. Appropriate land use planning, permitting, development practices, and enforcement of local ordinances are necessary to protect sensitive ecological areas, minimize land disturbances and retain natural drainage and vegetation whenever possible.

9. Temperature

Exceedances of temperature standards have been observed in several Alaskan streams through recent monitoring efforts conducted by USGS and from DEC grant funded projects. Few measurements of temperature were recorded previously. It is not known if temperature exceedances are due solely to natural conditions or to human activities. Potential causes may include climatic changes and the removal of forest cover in urban settings and logged areas that result in temperature increases in groundwater and surface runoff. Other potential causes may be the loss of riparian cover due to urban development and flooding from natural events possibly accentuated by human activities.

10. Solid Waste

Permitted municipal solid waste (MSW) disposal facilities are reviewed by the DEC, Solid Waste Program to ensure they are located and designed to safely accommodate MSW and to control pollution from migrating off-site. In contrast, un-permitted MSW disposal facilities have not been formally evaluated by the Solid Waste program and may lack required controls. As such, the level of risk that un-permitted disposal facilities have on the environment is unknown. Potentially, many of these un-permitted disposal facilities may be improperly located and managed, and may have contaminant migrating offsite.

Of the 300 small municipal landfills identified as Class III facilities in the state, approximately 50 have current permits. Approximately 250 un-permitted disposal facilities in the state have uncontrolled access and are open 24 hours per day. An unknown number of un-permitted Class III facilities may be located in wetlands or adjacent to waterbodies.

In order to identify the quality of water influenced by un-permitted landfills, DEC solicits sufficient and credible information to support remedial action, and if necessary to develop a sampling strategy for waters that necessitate attainment requirements. This information is necessary for the Nonpoint Source Pollution Water Pollution Control program to characterize all water bodies within the state, as required by federal law. Waters that may be negatively impacted by un-permitted solid waste facilities should be monitored to establish water quality conditions.

Residential solid waste consists of materials discarded from single and multi-family dwellings and individuals. It commonly includes paper, plastic, glass, metal, rubber and leather, textiles, food wastes, yard wastes, and household hazardous wastes. Other items commonly discarded in rural Alaska include: animal carcasses and sewage

Open burning MSW in rural Alaska is widely practiced to reduce waste volume and make the waste less attractive to animals. "Open burning means the burning of a material that result in the products of combustion being emitted directly into the air without passing through a smoke stack. Open burning includes burning garbage directly on the ground, in burn cages, and in burn barrels. Open burning is the least effective and most hazardous form of combustion. Unless closely managed, an open burn cannot achieve the temperatures needed to completely burn many components of municipal garbage. This allows the formation of potentially hazardous materials and renders ash that is more attractive to animals and more likely to cause surface and groundwater pollution at landfills."

Open burning is an accepted form of waste management for Class III facilities. Common materials that pose a threat to the environment when burned are: foam, rubber, plastic, household hazardous waste, which release dioxins and other deleterious compounds when improperly burned. Such surface or groundwater pollution is particularly a concern in areas of high precipitation due to leachate formation. Leachate is a solution of

dissolved and suspended particles of waste matter that form when water comes into contact with waste.

For more information on open burning the DEC, Division of Environmental Health, Solid Waste Program prepared a publication for small communities considering incineration and energy recovery titled "Burning Garbage and Land Disposal in Rural Alaska"(May 2004) at the following web address:
http://www.dec.state.ak.us/eh/docs/sw/Burning%20Garbage%20Factsheet.pdf

B. Management Measures and Indicators

The following Management Measures and Indicators will be used to assess the State's success in achieving its Urban and Community Development goals and objectives.

- Number of assessed rivers, streams and reservoirs designated for drinking water use that fully support use as a drinking water supply (based on 305(b) report and 303(d) list).

- Number of assessed waterbodies that protect public health and the environment by supporting: a) human consumption of fish and shellfish, b) safe recreation, and c) healthy aquatic life use designations (based on 305(b) report and 303(d) list).

- Number of regulated on-site sewage disposal systems that cause human illness or public illness outbreaks

- Number of known polluted waters in urban areas or communities that have a TMDL or waterbody recovery plan and the plans are being implemented.

- Number of stormwater permit applications submitted to EPA statewide that are in urban areas and are being reviewed by the department.

C. Regulatory Controls

Examples of municipal ordinances that address nonpoint source water pollution appear in a table in Appendix G. The table is organized by nonpoint source Section 6217 category according to the management measure addressed. Each ordinance or ordinance subsection is identified by locality, title and reference number, and is hyperlinked to the actual ordinance text.

Alaska's most populated areas (Anchorage and Fairbanks) are excluded from implementing the Existing Development management measure because they have been designated as municipalities subject to EPA's National Pollutant Discharge Elimination System (NPDES) Phase I and Phase II Storm Water regulations. According to Section 6217 program guidance, once a source is covered by an NPDES permit, it is exempt from 6217 requirements. Alaska has one Phase I designated area (Anchorage) with a NPDES

stormwater permit. There is one Phase II designated area (Fairbanks), where two NPDES stormwater permits became effective June 1, 2005.

For watersheds outside these areas, the state will implement the existing development management measures through the ACWA program. ACWA includes a decision tree and ranking process to determine if the state's waterbodies are adequately protected. The 303(d) list is used to assist with prioritizing waterbodies and identifying water quality impairments, including those caused by existing development. Waterbodies at risk or in need of restoration are identified through this ranking process. The ranking system is then used to identify, prioritize, and implement additional protection or restoration efforts needed for these "waterbodies-at-risk". Each year, the high priority waterbodies are reevaluated to determine if additional actions are needed, and every five years all waterbodies are reevaluated to determine their priority. Alaska can also limit the destruction of natural conveyance systems through permitting avenues such as its 401 Certification of CWA Section 404 fill permits.

The State of Alaska regulates onsite sewage disposal systems through its Wastewater Disposal regulations (18 AAC 72). Conventional systems may be installed by a person who obtains department certification as an installer on a two-year retraining and recertification basis. Engineered plans for non-conventional onsite systems must be submitted to the department for review and approval prior to installation. For engineered systems, the department has a two-step process, first granting approval to construct and secondly granting approval to operate, after the installed system documentation is submitted to the department. For onsite systems installed by certified installers, the approval process is streamlined.

As a condition of approval, the department requires that the homeowner properly operate and maintain the onsite system, according to manufacturer specifications typically found in the system manual provided to the owner. The department encourages homeowners to keep records of their onsite approval, system drawings, and system Operation & Maintenance (O&M). The homeowner is the party responsible for properly operating and maintaining the onsite system, and may become aware of problems only after the onsite system malfunctions, wastewater surfaces, or odors occur. The department becomes aware of failing onsite systems through complaints or at the time of the property sale as part of an engineer's report. The department works with homeowners when they replace a failing onsite system through the submittal of engineered plans for the new system or through oversight of certified installers. The department also cooperates with the real estate and mortgage lending institutions to verify onsite system records and to encourage proper operation and maintenance through the point of sale process. Also, the department works with local governments, by providing technical assistance or sharing engineered plan approval records, as local officials approve new onsite systems under their local building and planning powers. In recent years, the department has also worked with some Alaskan communities that are beginning to focus attention on municipal ordinances to address onsite system O&M within their municipal boundaries. In Anchorage and

Valdez, the OSDS program is delegated to the local government under a renewable agreement.

D. Key Partnerships

State Agencies
DEC Programs: Nonpoint Source Water Pollution Control, Wastewater Discharge, Water Quality Assessment and Monitoring, Village Safe Water, Drinking Water, Solid Waste, Prevention and Emergency Response, Contaminated Sites, Municipal Water Sewerage and Solid Waste Matching Grant recipients

DNR Programs: Water Rights, Alaska Hydrologic Survey, Land Use Planning, Soil and Water Conservation Districts, Office of Habitat Management and Permitting (OHMP), Office of Project Management and Permitting, Coastal Nonpoint Source Pollution, ACMP

DFG Programs, Sport Fish, Special Areas

DOTPF, Statewide Planning, Harbors, Storm drain

University of Alaska Anchorage Environment and Natural Resources Institute (ENRI) and College of Engineering, University of Alaska Fairbanks, University of Alaska Southeast

Federal Agencies**:** EPA,U.S. Geological Services, Army Corps of Engineers, NOAA/Office of Oceans & Coastal Resource Management, , National Park Service, Bureau of Land Management, U.S. Forest Service, and U.S. Fish and Wildlife Service

Local Governments**:** Alaska municipal governments (organized boroughs, unified home rule municipalities, incorporated cities), coastal districts

Tribal/Native Organizations: Native Regional Corporations, Villages, and Councils, Intertribal Councils

Non-governmental Organizations/Private sector industries: watershed partnerships, real estate industry and home mortgage lending institutions, Soil and Water Conservation Districts. Alaska Associated General Contractors

Other:
Professional engineers and contractors

Homeowners

E. Goals for Reduction of Pollution from Urban and Community Development

Alaska's nonpoint source pollution goals with respect to Urban and Community Development follow:

- Promote and encourage local watershed protection and the protection of community water resources.

- Assess statewide water quality protection efforts and offer tools for effective planning and permitting.

- Promote educational opportunities to control and abate nonpoint source pollution that are a result of particular land uses related to urbanization and human activities.

- Promote proper operation and maintenance of onsite sewage disposal systems through clear regulatory requirements on system approvals, homeowner education (Internet-based materials); cooperation and technical assistance to local governments in their building permitting, planning approvals, and ordinance development; cooperation with mortgage lenders on point of sale requirements for Operation and Maintenance, system upgrades, and effective enforcement.

Table 2. Urban and Community Development Action Plan (UR)

Action Plan Objectives & Tasks	Responsible Agencies & Organizations	Timeframe for Completion of Action	Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)
UR-A. Support local watershed protection efforts and encourage communities and the public to protect their local water resources.			
UR-A1. Develop criteria to guide local governments to assume responsibility for runoff pollution control programs, with criteria for local program delegation, types of activities that require runoff control, waivers, exemptions, and variances, authority for storm water utilities, design criteria, permit application and approval process, inspection requirements, maintenance requirements for post construction runoff control facilities, penalty provisions in the event of noncompliance with requirements for the design, construction, or operation of storm water management systems.	DEC, Local Govts	2008	
UR-A2. For all municipalities over 5,000 people audit their watershed protection capabilities to implement watershed practices, including examination of programs, regulations, ordinances, master plans, staff resources, and funding.	DEC, Local Govts	2008	
UR-A3. For all municipalities over 5,000 people, ensure that practices and/or ordinances exist that include requirements for on-site sewage disposal system selection, siting, design, and installation based on performance requirements, prescriptive technologies, protective setbacks, and separation distances; and ongoing homeowner system operation and maintenance that protect surface and ground water resources.	DEC, Local Govts Mortgage lending institutions	2008	
UR-A4. For all municipalities over 5,000 people, ensure that practices and/or ordinances exist that include requirements for routine inspection, maintenance, and pumping of all onsite sewage disposal systems within the municipal boundaries. For the municipalities with an active building permit process, ensure that practices or ordinances exist that include requirements for inspection of newly installed onsite systems during construction to verify that the installation meets the approved design and siting criteria.	DEC, Local Govts	2010	
UR-A5. For all communities over 5,000 people, develop a targeted approach for meeting the 6217 New Development Management Measure.	DEC, Local Govts	2012	Chap 4 URBAN II A New Development

Table 2. Urban and Community Development Action Plan (UR)			
Action Plan Objectives & Tasks	**Responsible Agencies & Organizations**	**Timeframe for Completion of Action**	**Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)**
UR-B. Provide educational, technical and financial assistance to communities to ensure good drinking water and basic sanitation and sewage disposal needs are met	DEC, Local Govts,	2010	Chap. 4. URBAN-V A, VB Public Participation Technical Assistance
UR-B1. For all communities over 5,000 people, ensure that practices and/or ordinances exist that maintain predevelopment site hydrology and limit unnecessary increases of impervious areas that create significant changes in the hydrology.	DEC, Local Govts	2010	
UR-B2. For all communities over 5,000 people, ensure that practices and/or ordinances exist that maintain post development average volume and peak runoff rates at levels that are similar to predevelopment levels.	DEC, Local Govts	2010	
UR-B3. For cities that have done stormwater mapping and identified problem areas, implement water quality enhancement projects and educational efforts to allow adequate and proper treatment of stormwater runoff and minimize adverse impacts to water resources.	DEC, Local Govts	2010	Chap. 4. URBAN -II A, III A, IV A, II C Public Participation Technical Assistance
UR-B4. For each community over 5,000 people, develop local ordinances, supported by a public education and awareness campaign, if necessary, to minimize stormwater runoff from new construction, including roads, highways and bridges	DEC, Local Govts	2010	
UR-B5. For all activities covered under NPDES general construction permits, ensure that prior to land disturbance, prepare and implement an approved erosion and sediment control plan that reduce erosion and, to the extent practicable, retain sediment on-site during and after construction.	DEC, Local Govts	2010	
UR-B6. In each community over 5,000 people, provide outreach to the public on ways to reduce pollution from improper use of fertilizers and pesticides.	DEC, UAF/CES Local Govt., NGOs	2010	Chap 4 URBAN-VI A

Table 2. Urban and Community Development Action Plan (UR)			
Action Plan Objectives & Tasks	**Responsible Agencies & Organizations**	**Timeframe for Completion of Action**	**Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)**
UR-B7. Upgrade failed community landfills to ensure leachate control and water quality concerns are met. Research the needs of rural village landfill problems.	Local Govts, DEC	2010	Chap 4 URBAN-VI A
UR-B8. For all communities over 5,000 people, develop stormwater management programs for their local areas that include at minimum: mapping existing stormwater drain systems, identifying water quality coming out of storm drains, and identifying storm drains that are inadequate or non-functional.	Local Govts, DEC	2010	Chap.4 URBAN-II A, III A, IV A, II B, III B, II C
UR-B9. In partnership with selected local governments that have ordinances in place (UR-A3), initiate a micro-loan program to support replacement of failed onsite sewage disposal systems in local areas, according to established criteria (for example, local comprehensive plan, documented fecal coliform pollution, public health, and environment).	DEC, Local Govts, financial institutions	2010	
UR-B10. Demonstrate a commitment to implement the targeted OSDS approach by providing an estimate of the percent or amount of funding Alaska anticipated to allocate to OSDS inspections.	DEC	2009	Chap 4 URBAN-V B.
UR-B11. Provide a description of what type of information related to OSDS inspections will be tracked with the Discharge Results and Online Permiting System (DROPS) database to EPA and NOAA.	DEC	2009	Chap 4 URBAN-V B.
UR –B12. Implement an OSDS inspection program.	DEC	Ongoing	Chap 4 URBAN-V B.
UR-C. Provide tools to incorporate effective water quality protection in land use planning and improved permitting and plan review decisions.			
UR-C1. Provide training materials and list of best management practices (BMPs) to cities, private sector developers and engineers doing construction activities.	DEC	Ongoing	Chap 4 URBAN-II A, III A, III B, II C

Table 2. Urban and Community Development Action Plan (UR)			
Action Plan Objectives & Tasks	**Responsible Agencies & Organizations**	**Timeframe for Completion of Action**	**Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)**
UR-C2. Develop a watershed management plan for ACWA high priority waterbodies that incorporates the nine elements recommended by EPA guidance on management plans.	DEC/NPS, DFG EPA, NGOs	2008	ALL MANAGEMENT MEASURES
UR-C3. Complete development of and publish biogeographically appropriate standard stream and lake habitat evaluation measurements.	DNR/OHMP, DFG	2008	
UR-C4. Maintain up-to-date forms on the department's website for submittal and department approval of onsite sewage disposal systems.	DEC	Ongoing	
UR-D. Promote educational opportunities to control and abate nonpoint source pollution. Tasks include:			
UR-D1.Develop standard criteria for design and evaluation of effective nonpoint source pollution education projects that must be followed for educational efforts funded through ACWA grants.	DEC	2008	
UR-D2. Support education programs on the proper operation and maintenance of on-site sewage disposal systems for the system owners (homeowners, small commercial businesses, etc.).	Local governments, UAF/CES, local Govts	2009	Chap 4 URBAN-II A, II B
UR-D3. Develop and implement statewide programs that provide education on proper disposal of pet waste to avoid impacts to surface waters	DEC	Ongoing	
UR-D4. Develop and implement statewide programs that provide education on proper disposal and control of trash to avoid impacts to surface waters.	DEC	2008	
UR-D5. Provide training materials, guidance documents and/or list of best management practices (BMPs) via the DEC web site on ways to reduce NPS pollution from gravel pits, snow storage, harbors and marinas, etc.	DEC	Ongoing	Chap 4 URBAN II A, III – A, III B, II C
UR-D6. Develop statewide stormwater management Best Management Practices manual and/or	DEC	2012	Chap 4 URBAN II A

Table 2. Urban and Community Development Action Plan (UR)			
Action Plan Objectives & Tasks	**Responsible Agencies & Organizations**	**Timeframe for Completion of Action**	**Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)**
regionally specific brochures regarding stormwater issues to fully satisfy this condition.			

Key:
DEC - Department of Environmental Conservation
DEC/NPS - Department of Environmental Conservation/Nonpoint Source program
EPA - U.S. Environmental Protection Agency
DNR/OHMP - Department of Natural Resources Office of Habitat Management and Permitting
NGO - nongovernmental organization
UAF/CES - University of Fairbanks Cooperative Extension Service

3. Forest Practices

Sediment is a major pollutant associated with forest practices activities conducted in Alaska that may adversely affect water quality and beneficial uses. Increased sediment loading to surface waters of Alaska may result from land disturbing activities associated with logging roads and timber harvesting operations. Excessive sediment in surface waters can adversely affect drinking water quality and the growth and propagation of fish and shellfish. Forestry operations conducted in uplands may also lead to changes in stream morphology and habitat due to altered runoff timing and yield which can adversely impact fish spawning and rearing habitat. Log storage and transfer facilities (LTF) in Alaska's coastal zone can potentially contribute tree bark and wood debris to estuaries which can result in the modification of benthic habitats and leach tannic acid, phenols, and oxygen depleting compounds. LTF permits from EPA (National Pollutant Discharge Elimination System) and State Wastewater permits require that Best Management Practices be used to minimize the discharge of bark. Pollution Prevention Plans for LTF's identify specific operational practices for transferring logs and handling logs in and out of water that minimize bark discharges.

A. Management Measures and Indicators

The following Management Measures and Indicators will be used to assess the State's success in achieving its Forest Practices goals and objectives. Responsible agencies will provide Indicator reports listed below to DEC to document the implementation and effectiveness of the management measures contained in the FRPA, forest practices regulations, and the Standards and Guidelines contained within TLMP:

- Inspection reports that document violations of the FRPA that result in degradation of water quality, including any directives or charging documents issued, corrective actions taken to achieve compliance, and inspection reports documenting success of mitigating measures. Absent such reports, FRPA and the Standards and Guidelines are presumed to be effective in maintaining water quality.

- BMP implementation and effectiveness monitoring reports from both state and federal agencies. These types of reports provide verification that BMPs are being properly implemented, and when implemented, are effective in maintaining water quality.

- Forestry / fish habitat status reports from both state and federal agencies. These reports are used to verify if riparian measures and practices provide for the maintenance of riparian values following timber harvest.

- Annual statistics on forest practices notifications, inspections, and variations. This information is used as baseline information on the scale of harvest activities across the landscape of lands regulated by FRPA.

All of the above will be used evaluate the effectiveness of the FRPA and Standards and Guidelines in maintaining water quality.

B. Regulatory Controls

1. Regulatory Controls for Forest Activities on State, Private and Other Public Lands

The State of Alaska's forest practices program is organized into two regulatory components: forestry activities that take place on state, private and other public land; and forestry activities that take place on federal land. "Other public lands" are defined as lands managed by state agencies other than the DNR, land owned by a municipality and land owned by the University of Alaska. Forestry activities on state, private and other public lands are regulated by the Alaska Forest Resources and Practices Act (FRPA) of 2006. Alaska's natural resource agencies (DEC, DNR- Division of Forestry (DOF) & DNR- Office of Habitat and Management and Permitting (OHMP) & DFG) also utilize the following references to guide their analysis of forestry related projects on state, private and other public lands: Alaska Administrative Code found at 11 Alaska Administrative Code (AAC) 95; Alaska's Water Quality Standards (18 AAC 70); Alaska's Coastal Clean Water Plan in accordance with CZARA §6217, and *Alaska's Nonpoint Source Water Pollution Control Strategy.*

Alaska's state forests and other public and private forests are divided into three state management regions:

- FRPA Region I- Coastal Sitka Spruce/Hemlock Forest;
- FRPA Region II- Interior Spruce/Hardwood Forest, South of the Alaska Range;
- FRPA Region III- Interior Spruce Hardwood Forest, North and West of the Alaska Range

DOF develops Forest Land Use Plans and timber sale contracts for the harvest of timber on state lands. DOF also receives Detailed Plans of Operation (DPO) for harvest of timber on private, municipal, and trust lands. These documents are an integral part of Alaska's forest practices regulatory program. The DOF is required to provide these planning documents to DEC and OHMP. DEC and OHMP review the Forest Land Use Plans and DPO's to evaluate potential impacts on water quality and habitat. DEC and the OHMP provide comments to DOF based on the above statutes and regulations to ensure that the BMPs contained in FRPA are implemented in the field.

2. Regulatory Controls for Forest Activities on Federal Lands

The second regulatory component of Alaska's forestry program pertains to forestry operations on federal lands. Forestry operations on federal lands in Alaska are regulated

by the 1990 Tongass Timber Reform Act (TTRA), the 1997 revision of the Tongass Land Management Plan (TLMP) and the CWA.

Currently, almost all forestry operations on federal lands in Alaska occur within the Tongass National Forest which is located in southeast Alaska. The recently revised Chugach National Forest Land and Resource Management Plan did not establish an allowable timber sale quantity and, therefore, no significant commercial timber harvest activities are planned for that forest. The Bureau of Land Management (BLM) manages vast forest resources in the interior portion of Alaska but these lands are generally not developed for timber harvest due to poor access and other factors.

In September 2006, the state received a proposal from the Forest Service for a General Consistency Determination (GCD) for commercial timber harvest activities conducted on the Tongass National Forest. The proposed GCD was prepared and submitted under Federal regulations promulgated by the National Oceanic and Atmospheric Administration (NOAA)(15 CFR 930.36(c)). The consistency determination states, in part, that the USFS has determined that "applicable Federal policies provide a degree of resource protection on Federal land that meets or exceeds that provided on State land by the applicable standards of the Forest Resources & Practices Act" … "Because the Federal policies included in the evaluation apply to all timber harvest activities conducted on the Tongass National Forest, we have determined that timber sales will be carried out in a manner that is consistent to the maximum extent practicable with the enforceable policies of the ACMP."

The state resource agencies and coastal districts reviewed and concurred with the Forest Service's consistency determination. Consequently, most Tongass timber sales will not go through individual an ACMP consistency review in the future. The GCD covers all activities associated with commercial timber sales conducted on the Tongass National Forest except those that require a State or Federal authorization outside of the State Forest Resources and Practices Act and those that involve public works. The GCD does not cover logging camps, construction or modification of log transfer facilities, or roads that require individual permits from the Corps of Engineers under the Clean Water Act. These activities will still require an individual consistency review under the statewide standards of the ACMP (11 AAC 112).

The U.S. Forest Service will continue to provide copies of all planning and National Environmental Policy Act (NEPA) documents to the State, and the State and coastal districts will continue to comment on USFS timber sales on the Tongass National Forest under the National Environmental Policy Act (NEPA) and Section 319(k) of the Clean Water Act. The State will also continue to participate in monitoring timber harvest and other activities, and continue to work with the USFS in ongoing efforts to improve the economic viability of the timber sale program, and to adjust the Tongass Forest Plan. The only change is that the state will no longer review individual timber sales for consistency with the ACMP.

C. Key Partnerships

Partnerships between state agencies, federal agencies, and the private sector are essential to successful implementation of the Strategy. Key partnerships already in place include the following:

- FRPA implementation- The FRPA depends on collaborative work by the state resource agencies; DNR/DOF is the lead agency. The agencies review notifications of operation and jointly conduct field inspections. DEC is granted due deference for water quality issues, and OHMP is granted due deference for fish habitat issues. OHMP also is responsible for resolving questions regarding stream classification on private land in Region I.

- Science and Technical Committee- A Science and Technical Committee with members from the state resource agencies, the USFS, the National Marine Fisheries Service, and private consultants led the review of forest practices standards in Region I that resulted in the 1999 revisions to the FRPA and regulations. A similar group with members from the state resource agencies, the US Geological Survey, the University of Alaska, and private consultants led the review of riparian management standards in Region III, which culminated in the passage of legislation that established new riparian protection standards for Interior Alaska. The Region II Science and Technical Committee, which was co-chaired by the DOF and OHMP, and had 15 members with expertise in fisheries biology, hydrology, forest ecology, forest soils, and in the management of Alaskan forests, fish, and water. This committee reviewed the riparian management standards for Southcentral Alaska and recommended changes to the riparian standards for Region II that passed by the legislature in 2006. This legislation requires timber retention on private forest lands along waterbodies that contain anadromous and/or high value resident fish in Region II. . Passage of this legislation satisfied the remaining outstanding condition for Alaska's CZMA Section 6217 forestry program.

- Monitoring- DEC and DOF jointly developed the protocols for implementation monitoring. DOF is the lead agency for conducting this monitoring; DEC and OHMP are encouraged to participate as well. The agencies have also cooperated with the timber industry and other private entities on effectiveness monitoring projects and peer review of the results.

- Road Condition Surveys -DOF and OHMP are jointly conducting road condition surveys on forest operations on non-federal land in southeast Alaska. DFG also participated in design of the database for this project.

- Research- Each year, DOF convenes a meeting to discuss and establish interagency and stakeholder funding priorities for water quality-related research and effectiveness monitoring of the FRPA and Regulations. Partners in this effort include representatives of state and federal agencies, the University of Alaska,

native corporations, the timber industry, and environmental groups. Examples of some of the research conducted to date are available in Appendix H.

- Board of Forestry- Oversight for implementation of the FRPA is provided by the Board of Forestry with broad representation of affected interests.

- Interagency Monitoring and Evaluation Group (IMEG) - This interagency group recommends USFS monitoring protocols and projects for implementation on the Tongass National Forest.

- Funding -DEC, DNR/DOF, DNR/OHMP cooperation on funding priority

D. Goals for Reduction of Pollution from Forest Practices

Responsible agencies will provide the appropriate items to DEC to document the implementation and effectiveness of the management measures contained in the FRPA, forest practices regulations, and the Standards and Guidelines contained within TLMP. Alaska's nonpoint source water pollution goals with respect to Forest Practices follow:

Goals for Private, State, and Other Public Lands

- Annual State agencies meetings will continue to set priorities and estimate budgets for the upcoming fiscal year. Top priorities should include evaluating and inspecting Forest Practices activities with the most risk of causing adverse impacts to water quality. The top priority for state agencies is continued funding for state agency personnel to conduct FRPA related work.

- Conduct ongoing review and evaluation of selected planning documents prepared under the forest practices program including Forest Land Use Plans and Detailed Plan of Operations to assure that adequate BMPs are in place to protect water quality.

- Conduct ongoing, periodic field inspections of timber harvest operations on state, private and municipal lands to assess compliance with the FRPA. Complete compliance score sheets for each inspection, and annually compile compliance data. Evaluate the effectiveness of state BMPs in meeting state Water Quality Standards.

- Provide training for state agency staff, forest land owners, and timber harvest and road construction operators through training workshops and field trips, and prepare and distribute public information materials.

- Implement revised riparian management standards for FRPA Region II.

Goals for Federal Land

- Revise and reauthorize the DEC/Forest Service Memorandum of Agreement (the revised document will be a *Memorandum of Understanding* (MOU)).
- Conduct routine forest practices activities including: 1) state review and evaluation of selected Forest Service planning documents to determine consistency with the National Environmental Policy Act (NEPA) and Section 319(k) of the Clean Water Act, state and federal regulations, Forest Service BMPs, and the *Alaska's Nonpoint Source Water Pollution Control Strategy*, 2) ongoing, periodic field inspections of timber harvest and road construction operations on National Forest lands in cooperation with the Forest Service, 3) and annual BMP implementation monitoring on a sample of national forest Ranger Districts with timber harvest and/or road construction activity.
- Evaluate the effectiveness of Forest Service BMPs in meeting State Water Quality Standards and protecting beneficial uses of waters of the state. Document these evaluations and make needed recommendations to improve future management through the Forest Service's Soil and Water Conservation Handbook (BMP Handbook).

Table 3. Forest Practices (FP) Action Plan

Action Plan Objectives & Tasks	Responsible Agencies	Timeframe for Completion of Action	Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)
FP-A. Action Plan Tasks for Forestry Activities on Private, State and other Public Lands.			
FP-A1. State agencies will meet annually to set priorities and estimate budgets for the upcoming fiscal year. The top priority for the state agencies is continued funding for state agency staff to conduct FRPA-related work	DOF, OHMP, DEC	Ongoing	Administrative Coordination
FP-A2. Conduct ongoing review and evaluation of selected planning documents prepared under forest practices program including forest land use plans and detailed plans of operation to assure that adequate BMPs are in place to protect water quality.	DOF, OHMP, DEC	Ongoing	Chap 3 FORESTRY II.A, II.B., II.C., II.D Chap 8 MONITORING
FP-A3. Conduct ongoing, periodic field inspections and compile compliance score sheets for timber harvest operations on state, private and municipal lands to assess compliance with the FRPA	DOF, OHMP, DEC	Ongoing	Chap 3 FORESTRY II.E, II.F, II. G, II.H –Monitoring
FP-A4. Provide training for state agency staff, forest landowners, and timber harvest and road construction operators through workshops and field trips, and prepare and distribute public information materials	DOF, OHMP, DEC	Ongoing	Technical Assistance
FP-A5. Evaluate the effectiveness of state BMPs in meeting state Water Quality Standards. Develop and reach consensus on standard methods and objectives for assessing BMP effectiveness.	DOF, OHMP, DEC	Ongoing	Chap 8 MONITORING Additional Measures
FP-B. Action Plan Tasks for Forestry Activities on Federal Lands			
FP-B1. Conduct routine forest practices activities including: 1) state review and evaluation of selected USFS planning documents to determine consistency with the state forest practices regulations and to demonstrate consistency with the Alaska Nonpoint Source Water Pollution Control Strategy, 2) ongoing, periodic field inspections of timber harvest and road construction operations on National Forest lands in cooperation with the USFS, 3) and annual BMP implementation monitoring on all national forest Districts with timber harvest and/or road construction activity.	DEC, OHMP USFS	Ongoing	Chap 3 FORESTRY II.A., II.B., II.C., II.D., II.E., II.F., II.G., II.H. – Chap 8 MONITORING

Table 3. Forest Practices (FP) Action Plan

Action Plan Objectives & Tasks	Responsible Agencies	Timeframe for Completion of Action	Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)
FP-B2. Revise and reauthorize the DEC/USFS Memorandum of Agreement (the revised document will be a *Memorandum of Understanding* (MOU))	DEC, USFS	2007	Administrative Coordination
FP-B3. Evaluate effectiveness of USFS BMPs in meeting state Water Quality Standards and protecting beneficial uses of waters; when necessary, make appropriate revisions to USFS BMP handbook & Forest Plan Standards & Guidelines, & prepare annual Monitoring and Evaluation report for interagency review	USFS, DEC, OHMP	Ongoing	Chap 8 MONITORING Additional Measures

Key

DEC	- Department of Environmental Conservation
DEC/NPS	- Department of Environmental Conservation/Nonpoint Source program
EPA	- U.S. Environmental Protection Agency
DNR/OHMP	- Department of Natural Resources Office of Habitat Management and Permitting
NGO	- nongovernmental organization
UAF/CES	- University of Fairbanks Cooperative Extension Service

4. Harbors and Marinas

A variety of challenges face harbormasters, water quality agency staff, and users of the state's harbors and marinas to prevent water pollution in and adjacent to these developed facilities. Water pollution sources from Harbors and Marinas are: harbor dredging, upland hull maintenance areas, fueling stations, construction and maintenance of sewage facilities, solid waste, and solid waste from the use of tidal grids, fish waste, hazardous material, stormwater runoff, and petroleum products.

A. Management Measures and Indicators

The following Management Measures and Indicators will be used to assess the State's success in achieving its Harbors and Marinas goals and objectives.

- Number of assessed waterbodies associated with harbors and marina that protect public health and environment by supporting a) human consumption of fish and shellfish, b) safe recreation, and c) healthy aquatic life use designations (based on 305(b) report and 303(d) list).

- Number of waterbodies on the Section 303(d) List of Impaired waterbodies that are listed because of nonpoint source pollution stemming from activities associated with harbors and marinas**.**

B. Regulatory Controls

Department of Natural Resources
Management of Boat Operation

DNR manages recreational uses and development activities, including boat operation, through Alaska Statutes (AS) 41.21.020 (duties and powers of Natural Resources; limitations), and AS 41.21.500 (Purpose of AS 41.21.500 - 41.21.514) and their pursuant regulations. DNR enforces regulations specific to the issue of boat operation for purposes of protecting fisheries and wildlife and their habitats within the Kenai River Special Management Area, in 11 AAC 20.860 (boat motor use), 11 AAC 20.862 (boating methods), 11 AAC 20.865 (establishment of non-motorized areas), 11 AAC 20.867 (personal water craft), and 11 AAC 20.870 (boating and aircraft speed limits).

DNR regulations applicable to other State recreation areas and other state land include 11 AAC 20.922 (use of power boats at Rocky Lake State Recreation site) and 11 AAC 20.985 (use of motorized boats) in twelve state recreation areas. Additionally, the director of the Division of Parks may impose restrictions on a use or activity in order to protect environmental values and resources. If the restriction is significant, it must be adopted as a regulation.

Municipal Nonpoint Source Pollution Ordinances

Thirteen local governments in coastal areas enforce ordinances regarding boat operation.

The linked table in Appendix F provides information on local ordinances and management practices of various Alaska communities, which manage boating activities to decrease turbidity and physical destruction of shallow water habitat.

Department of Transportation and Public Facilities
DOTPF negotiates harbor management agreements with communities to maintain and operate state harbor facilities. The management agreements are written in general terms to ensure the operator complies with all existing and future federal, state and local laws, regulations, and ordinances. The agreements may be supplemented to specifically cite new rules or regulations. If nonpoint source pollution controls are adopted under a federal law, state statute or municipal ordinance, they will automatically be included in the agreements. If nonpoint source pollution controls are adopted in the form of guidelines, they may be recommended by the state for implementation. Funding for these changes would come from increased user fees or state grants. DOTPF has the authority to ensure compliance with the harbor management agreements. Failure to comply with terms of the agreement is set out in each individual agreement. In general, the state may cancel the agreement on 60 days notice for failure to comply with its terms. The operator may also cancel the agreement, in which case the state would be responsible for operation and maintenance of the facility.

The Coastal and Harbors Design Procedures manual was cooperatively written by DOTPF and the U.S. Army Corps of Engineers (COE). The final manual addresses all aspects of siting and design of harbors including flushing, water quality assessment, habitat assessment, shoreline stabilization, stormwater runoff, fueling station design, sewage facilities, grids and solid waste management. Other state and federal agencies review and comment on the manual as it is periodically updated. The manual recommends best design practices for coastal harbor design Best Management Practices. The web address for this manual is:
http://www.dot.state.ak.us/stwddes/desports/resources.shtml

The Alaska Sea Grant College Program, University of Alaska Fairbanks published the Northern Harbors and Small Ports Operation and Maintenance manual. This manual includes chapters on best management practices for hazardous and other materials used in harbor construction and maintenance, operation and maintenance of marine structures such as fish cleaning stations and mooring docks, and a thorough discussion of marine construction materials. The web address for this manual is:
http://www.dot.state.ak.us/stwddes/desports/assets/pdf/northharbors_smports_ops.pdf

C. Key Partnerships

Key partners for harbors and marinas include the Alaska Association of Harbormasters and Port Administrators; State of Alaska resource agencies (DEC, DNR, and DFG); the Army Corps of Engineers; the United States Coast Guard; the DOTPF; University of Alaska Marine Advisory Program, , municipalities, citizens concerned by harbor and marina activities, and coastal district coordinators.

D. Goals for Reduction of Nonpoint Source Pollution from Harbors and Marinas

Alaska's nonpoint source pollution goals with respect to Harbors and Marinas follow:

- Education of harbor and marina users that their actions can affect water quality and cause pollution.

- Design future harbors and marinas to maximize opportunities for adequate flushing and to incorporate infrastructure to address sewage, used oil, other vessel-generated wastes, and stormwater issues that affect water quality.

- Develop an implementation and effectiveness program for harbors and marinas BMPs.

- Continue the process to support development of Harbor Management Agreements for communities that need them.

- Expand existing harbor and marinas to include fish waste disposal, hazardous waste collection efforts, construct new and expand existing pump-out stations.

- Encourage community workshops on spill prevention planning and how to comply with the Marine Oil Pollution (MARPOL) Act and DEC spill regulations.

Table 4. Harbors and Marinas Action Plan (HM)

Action Plan Objectives & Tasks	Responsible Agencies & Organizations	Timeframe For Completion of Action	Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)
HM-1. Provide Corps of Engineers guidelines to dredging activities to minimize impacts of dredging & disposal of dredged material	DOTPF, Local Govts, Corps of Engineers	On-going	Chap. 5 HARBORS-II A, II B, II C
HM-2. Maintain U.S. Coast Guard requirement that fuel spills over five gallons are reported. Maintain DOTPF Harbor Management Agreements that require fuel dock operators to have spill equipment on-scene, and appropriate spill prevention plans. Hold workshops on how to prepare oil spill response plans and how to comply with MARPOL and DEC regulations.	Coast Guard DOTPF Local Govts	On-going	Chap. 5 HARBORS-II F, III D Public Education
HM-3. Establish procedures to ensure water quality and aquatic habitat concerns are considered in design and siting of new and significantly expanding marinas. Ensure developers who site and construct harbors or marinas are familiar with Alaska Coastal and Harbor Design Procedures manual.	DOTPF Local Govts	On-going	Chap. 5 HARBORS-II A, IIB, IIC, IID, IIE, IIF, IIG
HM-4. Evaluate potential of stormwater discharges from new upland hull maintenance areas for impact on ambient water. Require oil-water separators, settling ponds or other mitigation if needed.	DEC, DOTPF Local Govts	2008	Chap. 5 HARBORS-II B, II C, II E
HM-5. Maintain cooperative program DOTPF and DFG to construct or expand pump-out stations in recreational harbors through Clean Vessel Act grants. Develop and distribute materials that educate boaters that dumping of untreated sewage is a violation of Alaska Water Quality Standards.	DOTPF Local Govts DFG	2008	Chap. 5 HARBORS-III F, III G – Public Education
HM-6. Continue U.S. Coast Guard administration of Marine Oil Pollution (MARPOL) Act requirements that harbors and marinas with over 100 vessels have Coast Guard certified waste disposal facilities. Encourage smaller communities to operate solid waste disposal receptacles available at harbors.	DOTPF Local Govts Coast Guard	On-going	Chap. 5 HARBORS-III A
HM-7. Further develop a harbor BMP program emphasizing operation & maintenance BMPs and need to immediately contain and clean up spills from fueling, bilge pumping, and develop options to dispose of used oil, bad fuel, batteries, solvents, antifreeze, paints, and other waste materials.	DOTPF Local Govts DEC	2008	Chap. 5 HARBORS-II F, III C, III D

Table 4. Harbors and Marinas Action Plan (HM)

Action Plan Objectives & Tasks	Responsible Agencies & Organizations	Timeframe For Completion of Action	Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)
HM-8. Increase number of communities involved in hazardous waste collection efforts at harbors & marinas. Work at improving coordination between community and harbors to collect and adequately dispose of hazardous materials generated from vessel use and maintenance.	DOTPF Local Govts DEC	2010	Chap. 5 HARBORS-III C
HM-9. For harbors and marinas where fish waste is an issue, require harbor operators to provide appropriate fish waste disposal as a term of the harbor management agreement.	DOTPF, DEC Local Govts	2010	Chap. 5 HARBORS-III B

Key:
DEC - Department of Environmental Conservation
DOTPF - Department of Transportation and Public Facilities

5. Hydromodification

Hydromodification refers to activities relating to dams, channelization, channel modifications, water withdrawals and human-caused shoreline and streambank erosion that can adversely affect water quality.

A. Management Measures and Indicators

The following Management Measures and Indicators will be used to assess the State's success in achieving its Hydromodification goals and objectives.

- Number of waterbodies on the Section 303(d) List of Impaired waterbodies that are listed because of nonpoint source pollution stemming from hydromodification activities.

- Number of assessed waterbodies associated with hydromodification that protect public health and the environment by supporting a) fish and shellfish consumption, b) safe recreation, and c) healthy aquatic life use designations (based on the 305(b) report and the 303(d) list).

B. Regulatory Controls

Department of Natural Resources
Division of Mining, Land and Water

The Department of Natural Resources has the authority under AS 46.17 to adopt regulations and issue orders necessary for ensuring dam safety. DNR enforces dam safety statutes and regulations through appropriate legal actions, if necessary, including issuing injunctions assuming operational control of the dam, breeching the dam, or other activities necessary to mitigate the risk. DNR permit requirements are enforced with the assistance of the state attorney general. A person is guilty of a Class A misdemeanor if the person "knowingly…violates…an approval, order, regulation, or requirement…" of the Department. If the situation demands, the Department of Natural Resources can seize control of a dam in an emergency and require the owner to comply with the permit conditions or have the work done and charge the owner. Persons giving false reports regarding the condition of a dam can be prosecuted under criminal statutes.

> Under AS. Sec. 46.15.147. *Termination of permits*, the DNR Commissioner can terminate the appropriation permit if the commissioner believes the permitee is willfully violating or has willfully violated a term, condition, restriction or limitation of his permit. Under AS. Sec. 46.15.180. *Crimes*, a person who violates the Water Use Act as specified in this section is guilty of a misdemeanor.
>
> *Article 6. Enforcement of 11 AAC 93.230 Water Management Regulations* specifies that a violation of a provision of the regulations, a lawful order of the commissioner issued under AS 46.15, or a term or condition of a permit or

certificate issued under this chapter is subject to corrective action under 11 AAC 93.280-11 AAC 93.290.

Water Resources Section
The Division of Mining, Land and Water, Water Management Unit is responsible for the following:

- Evaluate in-water related development projects (hydroelectric developments, public water supply, water exports, etc.) that may have the potential to negatively impact fish and wildlife resources and access to those resources through the appropriation and use of water.
- Collect and analyze data to ensure that water-related development projects leave enough flow to support existing permitted uses and the public interest such as recreation, transportation, fish, wildlife and aquatic habitat.
- Facilitate permitting as a multi-agency effort to ensure the maximum use of water resources and still protect holders of prior water rights, as well as water quality, fish and wildlife populations, aquatic habitat, and other public interests.

Alaska Hydrologic Survey
The objective of the Alaska Hydrologic Survey (AHS) is to provide technical hydrologic information to ensure proper and accurate management of the State's water resources for the benefit of the people of the State of Alaska. Hydrologic data are provided to state, federal, and municipal governments, as well as industry and the general public. The statutory basis for the AHS existence and programs are under AS 41.08. Under this statute , AHS is specifically charged with "the systematic collection, recording, evaluation, and distribution of data on the quantity, location, and quality of water of the state in the ground, on the surface of the ground, or along the coasts, are in the public interest and necessary to the orderly domestic industrial development of the state. More information is available on the DNR, Alaska Hydrologic Survey website at: http://www.dnr.state.ak.us/mlw/water/hydro/index.htm

Dam Safety Construction Unit
DNR is the lead agency for implementation of the Alaska Dam Safety Program, administered by the Dam Safety and Construction Unit. The dam safety regulations are articulated under Article 3 of 11 AAC 93. The current dam safety regulations require the applicant to submit an erosion control plan. Proposed revisions to 11 AAC 93.171(c)(11) require "an erosion control plan documenting measures to be used during and after construction to limit erosion, both within the construction site and in the downstream channel." In determining whether or not an erosion control plan is acceptable, the Dam Safety and Construction Unit considers the stability of the stream channel immediately above and below the dam, how the stream will be controlled during construction, the dam foundation materials, the method of construction and dam construction materials, and site surface drainage during construction.

For existing dams, a current periodic safety inspection and a current operations and maintenance manual are required to receive a certificate of approval to operate a dam. A

new certificate of approval to operate a dam is required every three years for Class I (high) and Class II (significant) hazard potential dams, and every five years for Class III (low) hazard potential dams. 11 AAC 93.19 requires the periodic safety inspection to be conducted by an Alaska registered, professional engineer under guidance provided by the Department of Natural Resources.

Office of Project Management and Permitting Alaska Coastal Management Program

Hydromodification projects within coastal zone boundaries that require a federal permit or permits from more than one state resource agency are subject to a DNR-OPMP multi-agency project review to ensure requirements of the ACMP are met. For hydro-modification projects that require permits from only one state resource agency, that state resource agency is responsible for coordinating the consistency review of the project. Projects must be consistent with ACMP standards (11 AAC 110) and comply with any statutes and regulations of the permitting agency (such as DNR or DFG) that authorizes the project.

Office of Habitat Management and Permitting (OHMP)

While DFG has the lead on the review of proposed hydroelectric projects, DNR -OHMP works with DFG and developers to site dams and channel modification projects so that they will not impede fish passage and destroy spawning habitat. Both DFG and OHMP may request that monitoring (pre, during, and post-construction) and mitigation provisions be integrated into the project plan during the early design phase. Pre-project studies are requested when data are insufficient for assessing the environmental impacts of a proposed project.

AS 41.14.840 (formerly AS 16.05.840), Fishway required, mandates that activities within a waterbody provide efficient fish passage, both upstream and downstream. Currently, OHMP applies this standard to all waterbodies known to support fish (resident or anadromous). There is no formal catalog of documented resident fish streams equivalent to the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes. OHMP does not apply the fish passage statute where the presence of fish is not documented. If OHMP is not certain of the absence or presence of fish, they may require developers to conduct field work to identify if fish are present.

AS 41.14.870, requires: a) the Deputy Commissioner of the Department of Natural Resources to specify the waterbodies important for the spawning, rearing, or migration of anadromous fish; b) a person or agency to notify OHMP before beginning any activities using, altering, or polluting a specified anadromous fish waterbody; and c) a person or agency must receive OHMP approval of project plans before beginning the proposed activity.

Department of Fish and Game (DFG)
Statewide Aquatic Resources Coordination Unit (SARCU)
The SARCU provides departmental coordination, scientific expertise, core personnel, data collection and analyses, and other relevant scientific information and actions needed by the DFG to comply with state, federal, and local laws. Fish, wildlife, and aquatic data are obtained, analyzed, and effectively used to make recommendations for sustaining fish and wildlife production, including waterway access.

Sport Fish Division
Chapter 20 of Title 16 provides the DFG and the Boards of Fish and Game permit jurisdiction over all land use activities within the State of Alaska's "Special Area" system of refuges, critical habitat areas, and sanctuaries. The Statewide Instream Flow Coordinator in the Division of Sport Fish also reviews many dam and channel modification proposals and estimates instream flow impacts.

Department of Environmental Conservation
The department regulates solid waste, liquid wastes, hazardous materials, and petroleum transportation and spills. Developers must obtain permits from the department if any of these materials will be used or generated during the construction or operation of dams or channel modifications. DEC is the lead water pollution control agency

Division of Water
The division issues Section 401 Water Quality certifications. DEC must certify, waive certification, or deny that an application for a federal license, such as a Federal Energy Regulatory Commission (FERC) license or CWA Section 404 permit that allows discharges into the navigable waters of the state meets Water Quality Standards. DEC has conditioning authority under the Federal Power Act, and may attach stipulations, including erosion and sediment control and stormwater runoff control measures, to the 401 certification to ensure that the project will not violate water quality standards.

Department of Commerce Community and Economic Development
Borough and city government floodplain management ordinances cover approximately 85% of the State's population that live in a community that regulates floodplain development through National Flood Insurance Program (NFIP) ordinances. The Department of Commerce, Community and Economic Development (DCCED), Division of Community Advocacy is the State coordinating office for the NFIP and has developed a *5-year Plan for Floodplain Management in Alaska*. Through improved mapping of hazard areas, and updating and improved implementation of the Governor's Administrative Order 175 for Floodplain and Erosion management, channel modifications and human-caused changes that result in erosion should be reduced. The DCCED Division of Community Advocacy is working with local governments to add "No Adverse Impact" floodplain clauses to ordinances that are updated as flood maps are updated. The majority of communities participating in the NFIP are also coastal districts. DCCED's 5-Year Plan for Floodplain Management objectives that relate are:

Update the State's Flood Insurance Rate Maps (FIRMs) and produce flood and erosion hazard maps for unmapped NFIP participating communities according to the following goals from Alaska's Map Modernization Plan (dated August 2002)

- Alaska's goal is to cut the average age of Alaska's flood maps in half (10.5 years) from 20.8 years ;
- Producing digital flood hazard maps with up-to-date flood hazard data for the 15-percent highest priority areas in the state; and
- Develop flood hazard maps for one-half of the unmapped, flood prone communities in Alaska.
- Develop an integrated floodplain and erosion management program. Currently no clear erosion management policies are coordinated at the federal and State level in Alaska. Goal is to integrate floodplain and erosion management.
- Establishment of a Federal-State Floodplain and Erosion Mitigation Commission to provide a coordinated management approach to the communities most threatened by flooding and erosion; provide guidance for community relocation. Establish an erosion assessment program for the most erosion prone communities/areas of the State. Integrate, where applicable, with digital flood hazard data layers.
- All of Alaska's Borough governments participating in the NFIP with compliant ordinances.

C. Key Partnerships

Key partners for preventing damage from hydromodification activities include the State of Alaska's resource agencies (DEC, DNR, DFG); the Army Corps of Engineers; the Natural Resources Conservation Service; federal land management agencies if the activity is within their land management jurisdiction (Bureau of Land Management, USFS, U.S. Fish & Wildlife Service and the National Park Service); and municipalities, organizations, private landowners and citizens that are concerned about a proposed hydromodification activity or streambank erosion impacts.

D. Goals for Reducing Nonpoint Source Pollution from Hydromodification

Alaska's nonpoint source pollution goals with respect to hydromodification follow:

- Maintain water quality and quantity in watersheds.
- Maintain healthy populations of plant and animal species by maintaining the aquatic and riparian habitats necessary to sustain them.
- Restore degraded water quality and quantity to meet Water Quality Standards and protect designated uses.
- Restore damaged aquatic populations by restoring their habitats.

Table 5. Hydromodification Action Plan (HY)

Action Plan Objectives & Tasks	Responsible Agencies & Organizations	Timeframe for Completion of Action	Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)
HY-A. Dams:			
HY-A1. Conduct project reviews of hydrologic activities to ensure that an adequate amount of water is reserved in lakes, rivers and streams to support fish populations.	DFG, DEC, DNR	On-going	Chap.8 HYDRO-III C
HY-A2. Develop best management practices (BMPs) program specific to dams to be incorporated in permits as permit stipulations. NOTE: Key elements of BMP program are *Erosion and Sediment control guidance* and specific requirements for proper storage & disposal of toxic materials from activities associated with dam construction.	DNR, DFG, DEC, OPMP	2010	Chap. 8 HYDRO-III A, III B
HY-B. Channel Modifications And Channelization:			
HY-B1. Ensure proposed channel modification and channelization projects are designed and monitored to minimize impacts to streams. Incorporate bioengineering techniques in design of stabilization projects to protect channelized streams.	DFG, DNR, NRCS	2010	Chap.8 HYDRO-II A, II B
HY-B2. For priority channel segments that need restoration on state or federal lands, the appropriate land manager leads in developing a restoration action strategy.	DFG, DEC, USFS BLM, Nat. Park Service	2010	Chap.8 HYDRO-II A, II B
HY-B3. Identify, in a priority list, and channel segments that have been significantly modified, or have significant erosion or habitat impacts, and schedule impacted streambanks for restoration activity.	DEC, DFG, DNR	2010	Chap. 8 HYDRO-II A, II B
HY-C. Shoreline and Streambank Erosion:			
HY-C1. Continue development of mechanisms to protect and restore habitats, using standardized data collection and management systems that allow for sharing data.	DFG	On-going	Chap. 8 Hydromodification
HY-C2. Monitor effectiveness of past habitat protection projects and report results in	DFG	On-going	Chap. 8

Table 5. Hydromodification Action Plan (HY)

Action Plan Objectives & Tasks	Responsible Agencies & Organizations	Timeframe for Completion of Action	Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)
standardized manner. NOTE: Reports should be updated periodically as new information becomes available.			Hydromodification
HY-C3. Increase public awareness of the characteristics of intact and damaged aquatic habitats, the need to protect and restore aquatic habitats, and techniques to protect and restore aquatic habitats	DFG, DNR - OHMP	On-going	Chap. 8 Hydromodification

Key:
DEC - Department of Environmental Conservation
DEC/NPS - Department of Environmental Conservation/Nonpoint Source program
DNR/OHMP - Department of Natural Resources Office of Habitat Management and Permitting

6. Mining

Before the large-scale development of oil resources in the 1970's, gold was historically Alaska's most valuable resource commodity. Significant changes have occurred in the Alaskan mining industry, including a major increase in the exploration for hard-rock gold and base metal deposits with the resultant expansion and development of existing and new lode gold mines. Lode gold production now exceeds placer gold production. The mining industry is one of the few sectors of the state economy that is expanding, due in part to the initiatives of the Alaska State Legislature and the Governor.

A. Management Measures and Indicators

The following Management Measures and Indicators will be used to assess the State's success in achieving its Mining goals and objectives.

- Number of assessed waterbodies associated with mining that protect public health and the environment by supporting a) fish and shellfish consumption, b) safe recreation, and c) healthy aquatic life use designations (based on 305(b) report and 303(d) list).

- Number of waterbodies on the Section 303(d) List of Impaired waterbodies that are listed because of nonpoint source pollution stemming from mining activities.

B. Regulatory Controls

Hard Rock

Nonpoint source pollution from hard-rock and coal mining operations are regulated through EPA NPDES permits, BLM 3809 regulations, the Alaska Surface Mining Act, and the State of Alaska Reclamation Act. In interior Alaska, the Fort Knox Mine, Illinois Creek Mine, and the Nixon Fork Mine have waste management permits from DEC, not NPDES permits, because there are no point-source discharges. Water quality concerns from nonpoint source pollution are considered during the large mine permitting process coordinated by DNR/OPMP.

State regulations require mines like Fort Knox, Illinois Creek, and Red Dog to monitor surface and ground water quality down-gradient from their facilities. The Kensington Mine is set up to operate with an integrated waste management permit. DNR covers these issues through approval of Plans of Operation and Mining Reclamation Plans. Waste rock disposal, storage, and/or treatment falls within existing DEC Solid Waste Regulations if there is an environmental problem with management of the waste, and drainage from those areas is addressed through DEC's state Water Quality Standards, permits, and DNR regulations. Drainage of soil from and over waste rock may qualify for a permit under NPDES stormwater regulations.

DNR is the lead agency for coordination of a large project permitting, multi-agency team review of proposed large mine projects. Tailings and waste rock can be covered under

DEC Solid Waste permits. Both the application of BMPs and the issuance of EPA NPDES storm-water permits can address waste rock discharges. BLM and DNR regulations require the assessment of acid rock drainage potential of ore and waste to minimize the potential for offsite drainage, and waters originating from waste dumps must meet DEC Water Quality Standards.

NPDES permits do not necessarily preclude nonpoint source or stormwater impacts. Adequate closure plans should be implemented to reduce the post-development nonpoint source impacts; BLM Section 3809 regulations and the State of Alaska Reclamation Act regulate these.

General or individual federal or state permits are another option for handling water permitting. The specific types of issues covered by these permits include: sediment that can drain from roads, wheel washing, concentrate on-and off-loading, waste rock storage, quarries, pit lakes, borrow pits producing fine sediment runoff, fuel and hydraulic fluid leak potential, and fill areas. There is the potential for acid generation or elevated metals in the runoff from these areas. Monitoring at specific sites for specific parameters of concern is considered in determining the NPDES reporting requirements.

Placer Mines

The two significant nonpoint source pollutants related to placer mining is sediment and turbidity. The EPA requires each mine operator to obtain a NPDES permit if there is any point source wastewater discharged to surface waters. This permit contains effluent limitations, BMPs, and monitoring requirements. The effluent limitations address settleable solids, turbidity, and total arsenic. Seasonal and daily monitoring are required and penalties for a negligent violation are set at maximum of $25,000 per day for each violation. Most placer operations today use BMPs to achieve zero discharge. Six BMPs are prescribed under the NPDES permit, which identify and control nonpoint source sediment load to receiving streams. These BMPs require:

- Bypassing surface water around the active mine area.
- Constructing berms and other water retention structures so that they prevent the passage of water.
- Storing pollutant materials (e.g., sediment) so that they are not released to streams using 100 percent process water recycling.
- Maintaining dikes and diversion structures to protect them from failure.
- Stabilizing all mine areas to prevent degradation of the receiving waters.

Most placer operations today use these BMPs to achieve "zero discharge". The State of Alaska Reclamation Act of 1991 requires reclamation of mining activities on all state and private lands. All operations on federal lands, and operations on state and private lands that exceed five acres of unreclaimed area, are required to post reclamation bonds to ensure the disturbed area is reclaimed.

Nonpoint source pollution due to runoff and erosion from mined areas, roads and camps can be controlled by enforcement of Bureau of Land Management 3809 regulations, the

State of Alaska Reclamation Act and the use of BMPs referenced in the Placer Mining Reference Manual from DFG.

Coal
The federal Surface Mining Control and Reclamation Act was signed into law in 1977 to regulate surface coal mining and reclamation nationwide. The law provided state's the opportunity to develop state coal programs and assume primacy over the coal program from the federal government. Alaska chose to administer the program and the Alaska Surface Coal Mining Control and Reclamation Act was approved in 1983. The Commissioner of the Department of Natural Resources was granted jurisdiction over surface coal mining and reclamation operations in the state.

Abandoned Mines
Historic abandoned mine sites exist in Alaska and can be potential sources of nonpoint source pollution. Reclamation of abandoned mines is handled primarily through DNR's Abandoned Mine Lands (AML) Program. State and federal laws created the AML Program for the purpose of reclaiming abandoned historic mines.

Land and water eligible for reclamation are those that were mined or affected by mining and abandoned or left in an inadequate reclamation status before August 3, 1977, and for which there is no continuing reclamation responsibility under State or federal law. AML funds can be spent on coal and non-coal abandoned historic mines. State, private, native and federal lands were eligible. Sunset for the collection of AML funds was the year 2004, set by federal law.

Every inventoried site was evaluated to determine if it qualified for AML funding. Federal policy requires that priority one and two coal projects be completed first. Priority three coal projects can be completed in conjunction with priority one and two projects or after all priority one and two projects have been completed. Only priority one non-coal projects can be reclaimed. Priority one non-coal sites can be worked on simultaneously with coal sites if the Governor has requested them. Because of the subjective nature of the criteria, priority two non-coal sites were identified for further evaluation. The three reclamation priorities are:

- Protection of public health, safety, general welfare and property from extreme danger resulting from the adverse effects of past coal mining practices.
- Protection of public health, safety and general welfare from adverse effects of past coal mining practices which do not constitute an extreme danger.
- Restoration of eligible lands and waters and the environment previously degraded by adverse effects of past coal mining practices, including measures for the conservation and development for soil, water (excluding channelization), woodland, fish and wildlife, recreation resources, and agricultural productivity.

C. Key Partnerships

Key partners for preventing nonpoint source pollution from mining activities include the Departments of Environmental Conservation, Fish and Game, and Natural Resources;

federal land management agencies if the activity is within their land management jurisdiction (Bureau of Land Management, USFS, U.S. Fish & Wildlife Service and the National Park Service); the EPA; tribal entities; and non-governmental organizations that deal with the mining industry. Miners are key participants in accomplishing the site work that would need to be done for long-term reclamation. Other important key partners are Resource Conservation & Development Council and the Alaska Miner's Association.

D. Goals for Reduction of Nonpoint Source Pollution from Mining

Alaska's nonpoint source pollution goals with respect to mining follow:

Active Mines

- Reduce erosion and runoff from disturbed upland areas during the active mining process.
- Focus agency efforts on land management for road building; borrow pits, culverts, and other mine features.
- Expand monitoring programs to assess nonpoint source impacts of mine expansions and impacts to creek drainages.

Abandoned Mines

- Protection of public health, safety, general welfare and property from extreme danger resulting from the adverse effects of past coal mining practices.
- Protection of public health, safety and general welfare from adverse effects of past coal mining practices which do not constitute an extreme danger.
- Restoration of eligible lands and waters and the environment previously degraded by adverse effects of past coal mining practices, including measures for the conservation and development for soil, water (excluding channelization), woodland, fish and wildlife, recreation resources, and agricultural productivity.

Table 6. Mining Action Plan (MI)

Action Plan Objectives & Tasks	Responsible Agencies & Organizations	Timeframe for Completion of Action	Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)
MI-1. Distribute guidelines to help miners, companies, and government land managers reclaim mine sites effectively and economically.	DNR, DEC, OHMP, Tribes	On-going	N/A* *Section 6217 program does not have a mining category.
MI-2. Develop strategy for monitoring priority suspected areas that are threatening fish habitat and domestic water supplies from nonpoint source sediment caused by placer and gravel mines. Use 2006 data summary assessment reports, bibliography and file of water quality & hydrologic monitoring studies to assess and prioritize efforts nonpoint pollution sources from abandoned placer mines. In addition to sediment, strategy should evaluate other likely pollution sources such as oil spills, hydraulic fluid dumps, chemicals, and solid waste disposal.	DNR, DEC, OHMP, Tribes	2010	Chapter 12 Monitoring
MI-3. Provide technical assistance to miners and landowners in applying and complying with reclamation standards. Monitor effectiveness of BMPs designed to reduce or control sedimentation from placer and gravel extraction activities.	DNR, DEC, OHMP, Tribes	2010	Chapter 11 Additional Management Measures
MI-4. Continue evaluation of effectiveness of BMPs, and develop improved BMPs where necessary.	DNR, DEC, OHMP, Tribes	2010	Chapter 11 Additional Management Measures
MI-5. Work with Federal resource agencies to cleanup selected abandoned mines. Other mines under a reclamation and closure plan should have those plans closely monitored for effectiveness of reclamation and restoration approaches	DNR, DEC, OHMP, Tribes	2015	Chapter 11 Additional Management Measures

Key
DEC - Department of Environmental Conservation
DEC/NPS - Department of Environmental Conservation/Nonpoint Source program
EPA - U.S. Environmental Protection Agency
DNR/OHMP - Department of Natural Resources Office of Habitat Management and Permitting
NGO - nongovernmental organization
UAF/CES - University of Fairbanks Cooperative Extension Service

7. Agriculture

Agriculture in Alaska is not the extensive source of nonpoint source pollution found in most areas of the contiguous United States. Alaska was listed in the 2002 United States Department of Agriculture (USDA) State Marketing Profiles with total farm marketing of 46 million dollars. This publication also ranked Alaska 50th of the 50 states in order of total farm marketing and ranks greenhouse/nursery, dairy products, hay, and potatoes as the four principal commodities in Alaska by order of marketing.

Alaska's total number of acres in cropland as of 2002 was 100,000 acres out of a total land area of 366 million acres. According to the United States Department of Agriculture 20,000 acres of harvested cropland existed in 2002. In 2005 there were 620 farms in Alaska with a final agricultural sector output of $58,471. These figures are from the United States Department of Agriculture Economic Research Service. The major source of agriculture related income is from nurseries and greenhouses in the Anchorage and Fairbanks areas. These figures do not take into account the much larger acreage of identified agricultural land that is currently rangeland, fallow, in Federal Reserve programs, or still forested. Alaska's agricultural production has been relatively stable for a number of years. Sustainable agriculture will potentially be an important part of the future economy of the State.

DEC's current List of Impaired Water Bodies and the state Water Quality Assessment does not identify any water bodies for which the beneficial uses are impaired because of agricultural activities. This results from a combination of the relatively small size of the agricultural sector and nature of agricultural operations in the state. The DFG states, "Because of the relatively low level of agricultural activity in Alaska, this *(agricultural impacts)* has not been a major focus of the department's attention."

A. Management Measures and Indicators

The following Management Measures and Indicators will be used to assess the State's success in achieving its Agriculture goals and objectives.

- Number of assessed waterbodies associated with agriculture that protect public health and the environment by supporting a) human consumption of fish and shellfish, b) safe recreation, and c) healthy aquatic life use designations (based on 305(b) report and 303(d) list).

- Number of waterbodies on the Section 303(d) List of Impaired waterbodies that are listed because of nonpoint source pollution stemming from agricultural activities.

B. Regulatory Controls

The 1995 *Alaska Coastal Clean Water Plan* found no significant impacts from any agricultural practices in coastal Alaska. The agriculture chapter of the *Alaska Coastal*

Clean Water Plan was the product of eighteen months collaboration by state and federal agencies, interest groups and the general public. It covers all agricultural areas of the state except for the Tanana Valley near Fairbanks and Kenny Lake in the Copper River watershed, which are outside the coastal zone.

The plan concluded that the enforceable policies of the *Alaska Coastal Clean Water Plan* are not needed for agricultural sources in Alaska and that the voluntary, BMP approach of the Nonpoint Source Pollution Program is a better way to manage agriculture in the state. The coastal nonpoint source program has received a categorical exclusion from EPA and NOAA for the agricultural source category.

Given these opinions and the low level of agricultural development in the state when compared to the size of the state, it would be easy to conclude that there are no nonpoint source pollution problems relating to agriculture. However, agriculture in the state is relatively concentrated within a few regions and at the watershed level is important. Water quality monitoring in the state is not developed enough to know the full extent to which agriculture may be a significant pollution source in certain watersheds.

C. Key Partnerships

The Natural Resources Conservation Service (NRCS), Alaska Department of Natural Resources Division of Agriculture, U.S. Department of Agriculture, Alaska Department of Fish And Game, University of Alaska Cooperative Extension, U.S. Environmental Protection Agency, Alaska Association of Conservation Districts and representatives of the general public interested in preventing and controlling water pollution from Agriculture.

D. Goals for reduction of Nonpoint Source Pollution from Agriculture

DEC's nonpoint source pollution goals with respect to agriculture are as follows:

- Continue to monitor the size and nature of the agriculture sector for any indications that the long-term trend of low levels of pollution might be changing.
- Maintain contact with stakeholders who are active in the agricultural sector and support identified efforts to prevent or control those sources of pollution that are identified as being of concern.
- Continue to support the main agricultural agencies in the state, DNR and Natural Resource Conservation Service (NRCS), in their efforts to prevent or reduce surface and groundwater pollution from agricultural activities.
- Monitor trends in the growth of feedlots and dog mushing kennels to assure that these animal-feeding operations do not cause serious, localized pollution problems.
- Support monitoring of the atmospheric deposition of pesticides from outside Alaska in arctic Alaska and in the marine food chain.

Table 7. Agriculture Action Plan (AG)

Action Plan Objectives & Tasks	Responsible Agencies & Organizations	Timeframe for Action	Corresponding Link to CZMA Section 6217 Guidance for Management Measures (Chapters cited where appropriate)
AG-1. Continue to participate in the NRCS statewide Technical Committee, which identifies agricultural impacts in Alaska. DEC participation in this committee is an important strategy to deal with any identified agricultural pollution problems.	DNR, NRCS SWCDs, DEC	On-going	N/A* *Agriculture category exempted under program approval. Chapter 11 Additional Management Measures
AG-2. Continue to provide funding for priority agricultural nonpoint source projects to the extent that they are identified as serious threats to water quality. Work with other partners to combine grant resources on any specific projects that may become priorities in the mid-term.	DEC, DNR, NRCS, SWCDs	On-going	N/A

Key:
DEC - Alaska Department of Environmental Conservation
DNR - Alaska Department of Natural Resources
NRCS - Natural Resources Conservation Service
SWCDs- Soil and Water Conservation Districts

8. Roads Highways and Bridges

Roads, highways and bridges (RHBs) are a new source chapter for the *Alaska's Nonpoint Source Water Pollution Control Strategy*. Most of the information compiled in this section has been taken from Alaska's efforts to develop and submit an approvable Section 6217 program addressing the required management measure for RHBs. Road construction activities disturbing less than 1 acre are the focus of the NPS Strategy.

Most of Alaska is not connected to the highway system. Many communities have limited local road networks that are unconnected to any statewide road network. Residents of these communities depend on a combination of air travel and fresh water or marine vessel transport for supplies and travel outside their communities.

There are currently 14,368 miles of public roads managed by state or local governments. The majority of this network is managed by four entities DOTPF (39% or 5,613 miles), Borough Governments (24% or 3,492 miles), Municipal Governments (13% or 1,906 miles). In addition, several agencies within the Department of the Interior, including the Bureau of Land Management and the Bureau of Indian Affairs, construct and maintain roads in Alaska.

EPA/NOAA Policy Clarification on Overlap of 6217 Coastal Nonpoint Programs with Phase I and II Storm Water Regulations memo (NOAA 2002), grants exclusion to the following activities associated with RHB from the management measures identified for conformance with the 6217(g) guidance:

- RHB construction projects that are covered by NPDES stormwater regulations (sites disturbing 1 or more acres of land)
- RHB operations, maintenance and runoff systems within urbanized areas subject to Phase I and Phase II Municipal Separate Storm Sewer Systems (MS4) permits. This excludes the Municipality of Anchorage and portions of the Fairbanks Urbanized areas.

Therefore, the RHB management measures described in this section do not apply to construction activities that disturb one or more acres or to maintenance and operations activities in Anchorage or Fairbanks.

Roads, Highways, and Bridges Publications

In early 2005, Alaska's Section 6217 state agency working group developed two brochures which address best management practices for the New Development and the Roads, Highways, and Bridges Conditions for approval of the State's Coastal Nonpoint Source Program. These brochures were sent to building officials in municipalities with populations greater than 2,000, and to cities within the Matanuska-Susitna and Kenai Peninsula Boroughs. Local building officials were encouraged to distribute the brochures to project applicants and to the general public. The brochures were also sent to each Coastal District Coordinator of the Alaska Coastal Management Program (representing

twenty-four local governments and four Coastal Resource Service Areas). Project applicants proposing to construct roads, highways or bridges received both brochures from State and Federal agency project reviewers.

The Roads, Highways, and Bridges brochure focuses on the 47% of public roads in Alaska that are managed by local governments. The brochure emphasizes best management practices for planning, design, construction and maintenance of road and bridge projects. The brochure provides references to online resources for compliance with construction general permit requirements, the State recommended practices manual for maintenance and service of unpaved roads, and other maintenance measures for roads and bridges.

The New Development brochure addresses stormwater and the construction industry. This brochure stresses the responsibility of construction site owners or operators in containing stormwater runoff and preventing erosion during all stages of a project. References are provided to online sources for Alaska's Water Quality Standards, best management practices for controlling erosion and sediment transport, the development of pollution prevention plans and sample construction plans. The title of this brochure is: "So You Don't Need a Construction General Permit – What You Can Do to Prevent Water Pollution."

A. Management Measures and Indicators

The following Management Measures and Indicators will be used to assess the State's success in achieving its Roads, Highways and Bridges goals and objectives.

- Number of acres of impacted wetlands impacted by Roads, Highways and Bridges for which mitigation is provided.

- Number of plan reviews conducted for stormwater treatment and discharge systems serving roads, highways, and bridges.

B. Regulatory Controls

Many of the highway projects in rural Alaska involve wetlands. A CWA Section 404 permit from the Corps of Engineers is required when wetlands or waterbodies are filled. This permit requires a 401 certification from the State of Alaska. The 401 certifications are issued by DEC and are the state's statement of reasonable assurance that the discharge will meet Alaska Water Quality Standards. To meet the Water Quality Standards, DEC may attach stipulations, including erosion and stormwater controls, to this certification.

State regulations require that anyone who constructs, alters, installs, modifies, or operates any part of a stormwater treatment or disposal system submit engineering plans for review.

DOTPF complies with these regulatory controls through its use of the Project Development and Maintenance Environmental Review Procedures; DOTPF's Alaska Highway Drainage Manual; DOTPF's Alaska Storm Water Pollution Prevention Plan Guide; DOTPF's BMPs for Construction Erosion and Sediment Control & Maintenance and Operations Activities, and the Federal Highway Administrations State Planning and Research Program.

Appendix I includes a list of local ordinances in Alaska's municipalities relating to roads highways and bridges that address nonpoint source pollution. Each ordinance is identified by municipality, ordinance, title, and reference number. Many Alaskan municipalities have codes of ordinances which are available online. Whenever possible, a direct link is provided to the local ordinance online. Otherwise, the ordinance text is available in PDF (Adobe Acrobat) format.

C. Key Partnerships

Local: borough governments, municipal governments

State: DOTPF, DNR /OHMP

Federal: Corps of Engineers, U.S. Coast Guard, Bureau of Indian Affairs

D. Goals for Reduction of Nonpoint Source Pollution from Roads, Highways and Bridges

- Protect sensitive ecosystems, including wetlands and estuaries, by minimizing road-building mileage in those systems, minimizing the number of water crossings, and establishing protective measures including setbacks during construction.

- Protect areas that provide important water quality benefits or are particularly susceptible to erosion or sediment loss.

- Limit land disturbance such as clearing and grading and cut and fill to reduce erosion and sediment loss.

- Limit disturbance of natural drainage features and vegetation.

- Limit runoff of pollutants through the use and proper maintenance of structural controls.

- Limit generation of pollutants from maintenance operations by minimizing the use of pesticides, of hazardous materials and incorporating measures to prevent spillage in sensitive areas.

Planning, Siting, and Developing Roads and Highways

Plan, site, and develop roads and highways to:

- Protect areas that provide important water quality benefits or are particularly susceptible to erosion or sediment loss.
- Limit land disturbance such as clearing and grading and cut and fill to reduce erosion and sediment loss.
- Limit disturbance of natural drainage features and vegetation.

Site, design and Maintain Bridges

- Site, design, and maintain bridge structures so that sensitive and valuable aquatic ecosystems and areas providing important water quality benefits are protected from adverse effects.

Construction Projects

- Reduce erosion and, to the extent practicable, retain sediment onsite during and after construction.
- Prior to land disturbance, prepare and implement an approved erosion control plan or similar administrative document that contains erosion and sediment control provisions.

Construction Site Chemical Control

- Limit the application, generation, and migration of toxic substances;
- Ensure the proper storage and disposal of toxic materials; and
- Apply nutrients at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface water.

Operation and Maintenance

- Incorporate pollution prevention procedures into the operation and maintenance of roads, highways, and bridges to reduce pollutant loadings to surface waters.

Roads, Highway, and Bridge Runoff Systems

- Identify priority and watershed pollutant reduction opportunities (e.g., improvements to existing urban runoff control structures).

Table 8. Roads, Highways, and Bridges Action Plan (RHB)

Action Plan Objectives & Tasks	Responsible Agencies & Organizations	Timeframe For Completion of Action	Corresponding Link to CZMA Section 6217
RHB-1. Non-designated stormwater MS4 communities with populations greater than 5,000 residents will incorporate pollution prevention procedures into the operation and maintenance of roads, highways, and bridges to reduce pollutant loadings to surface waters.	DOT&PF, DEC, Local Govts	On-going	Chap. 6Urban & Community Development RHBs –VII 5
RHB-2. Non-designated stormwater MS4 communities with populations greater than 5,000 residents will: Identify priority and watershed pollutant reduction opportunities (e.g., improvements to existing urban runoff control structures; and Establish schedules for implementing appropriate controls.	DOTPF, DEC, Local Govts	On-going	Chap. 6 Urban and Community development RHBs – VII 6
RHB-3. All communities with populations greater than 5,000 residents will plan, site, and develop roads and highways to: Protect areas that provide important water quality benefits or are particularly susceptible to erosion or sediment loss; Limit land disturbance such as clearing and grading and cut and fill to reduce erosion and sediment loss; and Limit disturbance of natural drainage features and vegetation.	DOTPF, DEC, Local Govts, DNR/OHMP	On-going	Chap. 6 Urban and community development RHBs – VII 1
RHB-4. All communities with populations greater than 5,000 residents will site, design, and maintain bridge structures so that sensitive and valuable aquatic ecosystems and areas providing important water quality benefits are protected from adverse effects.	DOTPF, DEC, Local Govts, Corp of Engineers, US Coast Guard, DNR/OHMP	On-going	Chap. 6 Urban and community development RHBs – VII 2

Table 8. Roads, Highways, and Bridges Action Plan (RHB)			
RHB-5. For all new highways and bridges, plan and design them to protect sensitive ecosystems, including wetlands and estuaries, by minimizing road-building mileage in those systems, minimizing the number of water crossings, and establishing protective measures including setbacks during construction.	DEC, Local Govts	2010	Chap. 6 Urban and community development RHBs – VII 2
RHB-6. Provide examples of how Alaska implements stormwater runoff control projects for local roads to the EPA and NOAA.	DEC	2008	Chap. 6 Urban and community development RHBs – VII 2

Key:
DEC - Alaska Department of Environmental Conservation
DNR/OHMP - Alaska Department of Natural Resources Office of Habitat and Permitting
DOTPF - Alaska Department of Transportation and Public Facilities

Appendices

Appendix A	Education Strategy
Appendix B	Information Management
Appendix C	Funding Sources
Appendix D	Agencies and Organizations
Appendix E	ACWA Process
Appendix F	Boat Operation Local Ordinances
Appendix G	Local Ordinances on Roads, Highways and Bridges

Appendix A – Education Strategy

WHY DOES THE DEPARTMENT NEED AN EDUCATION STRATEGY?

Alaska is fortunate to have abundant water supplies, however, contrary to popular belief, not all of those waters are of pristine and healthy quality. Alaskan's and others who utilize our waters have historically enjoyed this resource with relative abandon. Today, the world is becoming increasingly aware of issues concerning water pollution and Alaska is no exception. Degradation of Alaska's streams and lakes from polluted runoff and other sources is an escalating threat. One that affects drinking water sources, the fishing and tourist industry as well as property values and many others factors. When asked how to protect and restore our waters, Alaskans identify education as a key element. For example, in a poll conducted of over 500 Alaskans at the Palmer State Fair in the fall of 1999, participants were asked which of 10 types of water pollution activities were most important to fund. Votes for education gathered almost twice as much support as any other activity, showing us that water quality education is a top priority to many Alaskans. There is an increasing appreciation that we all have a part to play in protecting and sustaining our waters. Education is essential to preventing water pollution by providing people with the knowledge, awareness, skills that will assist them in taking action to conserve one of Alaska's richest resources. Education, access to information and active participation is not just a priority for school children; it must be a lifetime commitment for all of us.

Some excellent water pollution education work has been undertaken by diverse and varied groups and organizations in recent years. It has taken many forms and consisted of brochures, television ads, public talks, school education, river walks, storm drain stenciling, and many other activities. It has targeted the general public as well as focused on hundreds of small audiences. The geographic area has varied in size from a statewide broadcast to a neighborhood approach and waters in people's back yards.

In order for other agencies and groups to work effectively with the Alaska Department of Environmental Conservation (DEC) the department must clarify priorities, goals, objectives and expectations. This approach will help build working relationships with a variety of partners. This strategy addresses this challenge. It attempts to:

- Raise awareness and understanding of water issues.
- Encourage the public to form a value for Alaska waters.
- Foster positive attitudes towards water quality management.
- Empower communities to participate in protecting and restoring Alaska's waters.
- Stimulate the public to take action to manage their individual impacts on waters.
- Develop partnerships and act as an information access portal between all sectors involved in water pollution education.

The time frame for implementation of the education strategy is from 2005 to 2007. Working together through this strategy will ultimately lead to better use of our limited resources, (human, monetary and environmental) toward a public that values and works to sustain our waters. The rewards will be a

community at large, actively working in partnership toward clean and healthy Alaskan waters to meet the needs of future generations.

WHAT ARE THE GOALS AND OBJECTIVES OF WATER POLLUTION EDUCATION?

The goal being pursued through the Water Pollution Education Strategy is one where Individuals and communities have the knowledge, skills and attitudes that instill a sense of ownership for water quality and create informed, involved decision makers. The following objectives of water pollution education will guide the implementation of this strategy: Each program or partnership in which DEC engages will enact:

Awareness: to help people to understand the impacts of our activities on the environment and our responsibilities.

Participation: to provide people with the capacity to be actively involved at all levels in helping resolve environmental problems.

Attitudes and values: to help people identify values of concern and responsibility for the environment and be motivated to care for the environment while reflecting those values.

Knowledge and understanding: to help people gain experience in and a basic understanding of the environment (through science and technology) and human interaction within it. Skills: to help people acquire the skills to participate effectively in decision making that affects the environment and to play a part in identifying and solving environmental problems.

CLARIFYING THE STATE'S OBJECTIVES

DEC clarified water quality objectives through stewardship it is pursuing in the interagency *Alaska Clean Water Actions*. In promoting a strategic approach towards water pollution education, the State wants to clarify the objectives it wishes to achieve. These outcomes give strategic direction to specific activities. The water pollution education outcomes being sought by the State are:

- Individuals, families and communities with the knowledge, skills, attitudes and values resulting in sound behavior that protects and enhances Alaska's waters. The effective transfer of knowledge gained from research and good practice to those that need it.

- Alaskan Native leaders have the knowledge and skills necessary to fulfill their responsibilities as partners in maintaining healthy waters.

- Effective use of water pollution education to help people and organizations understand and implement environmental and other policies.

- Well-informed participation of communities in issues affecting their waters and the effective integration of water pollution education within school curricula.
- Integration of water pollution education into business and professional work practices.

WHAT IS WATER POLLUTION EDUCATION?

While there are many definitions of water pollution education, there is no common definition of what is meant by "water pollution education". For the purpose of Learning to Care for our Waters", water pollution education is defined as:

"A multi-disciplinary approach to learning that develops the knowledge, awareness, attitudes, values and skills that will enable individuals and the community to contribute toward maintaining and improving the health of the waters of Alaska." This definition recognizes: The influence of water pollution education on values, attitudes and behavior.

- The multi-disciplinary nature of water pollution education and emphasis on linkages between health of our waters and social, economic and political activities

- The contribution of education to conserving and managing Alaskan waters

- The range of learning activities encompassed by water pollution education which include formal and non-formal education for all ages.

- This education is therefore not just about classroom learning but about all activities intended to inform Alaskan's about our waters and their management. This list illustrates the types of organizations providing water pollution education. It is not exhaustive.

WHAT IS CONSERVATION?

While this might seem like a fundamental question, it is important for those who might partner with DEC to understand how our Department uses this term. The definition of the word "conservation" found in Webster's 2nd Edition New World Dictionary is explained as "the act or practice of conserving, protecting from loss, waste, etc." DEC protects beneficial uses from waste by implementing conservation through implementing statutes and regulations. Sometimes that means not using the resource at all for a time, with the realization that use and future use of resources will be considered. DEC's mission reads: "*It is the policy of the state to conserve, improve, and protect its natural resources and environment and control water, land, and air pollution, in order to enhance the health, safety, and welfare of the people of the state and their overall economic and social well being."* At DEC we are interested in water, but most of all we are interested in Alaskans, ascertaining their needs to live a productive, healthy and safe lifestyle.

WHY IS WATER POLLUTION EDUCATION IMPORTANT TO ALASKA?

Increasingly, the American public has become aware of toxicity in the environment, whether on a national level, regional or local. Most people have some degree of awareness, perhaps as a result of information access through the World Wide Web and other sources. Pollution from motor vehicles, contamination of

water by chemicals, construction, and sewage discharges, these and hundreds of other human activities stress our waters. The impact of these activities in Alaska is seen in Alaska's list of impaired waterbodies. An effective policy framework for protecting and managing Alaska's waters requires an integrated approach that includes sound policies, knowledge about the environment, the communication of information, and responsible behavior by individuals and communities. Within this framework, water pollution education contributes to the communication of information and to the development of understanding, skills including empowerment, attitudes and values that influence the behavior of individuals and communities, including rural communities. With ever decreasing school budgets, some responsibility falls on our shoulders to educate the public in regard to scientific concepts and research. Science at the college level in Alaska is often as leading edge as science can be. By integrating the science into our communications, we educate directly and on the periphery. We cannot stop there. Students and learners of all ages must be motivated to act based on the attributes obtained through education as part of their lifestyle. Education for adults who are current decision makers and policymakers is also important at this critical time in looking at the long term conditions of Alaska's waters.

WHO PROVIDES WATER POLLUTION EDUCATION?

There are many providers of water pollution education within this state and beyond. Within the formal education sector, these providers can include primary and secondary schools, the universities, and other adult education training institutions.

Outside of the formal education sector there is a wide variety of providers that undertake water pollution education activities. These include resource agencies undertaking specific programs or less formal activities to promote the implementation of policy or a particular bias. They also include local authorities which could use water pollution education as a tool to achieve objectives of policies, plans and community projects. But providers extend well beyond state and local government. Federal research institutions, private institutions, watershed councils and other similar community groups, industry groups, and the environmental consulting industry are among those that undertake activities that may be seen as "water pollution education".

WHAT ARE THE NEEDS IN ALASKA REGARDING WATER EDUCATION?

The Alaska Natural Resource and Outdoor Education Association published a recent report that focuses on the needs of educators (formal and non-formal) throughout Alaska called the Status Report, Environmental Education in Alaska. They report that educators have called for continued support toward incorporating best practices as well as state education standards to put into teaching practice. Teachers also called for long term support and resources needed for training, not just in resource education, but also in science. Many teachers choose not to focus on resource education simply because they lack expertise in the subject.

We also know that Alaska's educators want locally relevant resources when they are teaching about Alaska's natural attributes. So many resources that are currently available do not directly apply to Alaska conditions or circumstances, making them difficult to implement and the students have difficulty connecting to the concepts.

Program developers voiced a need for infrastructure that includes environmental education programs in all relevant State agencies, especially the Department of Education. Here we find some support for resource education; however, the programming is lacking the inclusion of other state resource education programs or a diversity of themes. Developers continue by asking for post-secondary degrees that meet standards for developing environmental literacy in all graduates. Evaluations need to be strengthened to ensure the appropriate assessment of a program is being performed. The report goes on to say that imparting knowledge about the natural world is not enough to instill a sense of stewardship. *"Hungerford and Volk found in order to effectively meet their goal, education practitioners and programs must provide activities that develop skills for analysis issues and activities that actively foster responsible stewardship."* A call for an increase in cultural diversity in programming was also noted to help integrate traditional knowledge and science.

In years past, there has been little attention to the accountability of environmental education. As we have seen, this has resulted in funding decreases and a redirection of focus by agencies, schools and other institutions. Educators and those who organize educational opportunities have not worked collectively or effectively in this state. Education has come together in a piecemeal fashion, as educators and program directors have led separate charges all over the state, sometimes overlapping materials or re-inventing the educational wheel. Alaska needs a coordinated effort to create a unified voice for water pollution education. The 'voices' that need to be heard include the Department of Education, on the ground educators-formal and non-formal, program directors from all sectors, naturalists, tour directors as well as industry representatives to list a few. While this may seem like an insurmountable feat, only when we begin to explore what materials are available and create a clearinghouse for the information can we ensure we are providing quality education that will achieve our goal and objectives.

WHAT TYPES OF ACTIVITIES ARE INCLUDED IN WATER POLLUTION EDUCATION?

The range of environmental activities is as extensive as the spectrum of providers. The methods of delivery also vary. Water pollution education involves a mixture of approaches and types. One useful classification includes three types:

- Education about water pollution - providing information about phenomena and circumstances that influence the health of Alaskan waters,

- Education in Alaskan waters - using field studies and other outdoor activities for learning and skill development and exploration,

- Education for or with our waters - where the activity is directed at influencing water pollution issues and actions.

All three types of water pollution education are valuable. One of the intentions of this strategy, however, is to encourage increased emphasis on those activities that will influence the way people treat or manage our waters. The location of these activities also ranges the spectrum from small groups monitoring water on a stream bed, to large forums intended for the general public. All programs and activities also require evaluation and assessment to ensure a high degree of quality programming and the desired results.

WHAT ROLE DOES DEC CURRENTLY HAVE IN WATER POLLUTION EDUCATION?

DEC fills several niches within the state concerning water education. The following description of programs and projects reveals DEC's current involvement in water pollution education.

Cooperation with other agencies: The Alaska Department of Fish and Game sponsors a program called Project Wild. This curriculum and the staff are dedicated to educating students K-12 about Alaska's wildlife. One cannot teach about wildlife unless you also teach about the needs of wildlife including habitat. The Alaska Department of Natural Resources has a complementary project called Project Learning Tree. This curriculum is geared toward student K-12 and teaches aspects surrounding forestry, also through a multi-disciplinary approach. DEC works with Project Wild and Project Learning Tree facilitators to develop and adapt curriculum that is cohesive in its message of conservation. DEC also uses a curriculum called 'Project Wet'. This set of K-12 lessons is specifically geared toward water pollution education. Currently, the Alaska Soil and Water Conservation Districts (ASWCD) are the primary hosts of this curriculum. DEC partners with ASWCD's often to present trainings and lessons as well as develop other curricula. Upon request we review materials for accuracy or work together in a team approach to teach a particular concept. DEC works in a similar way with the US Fish and Wildlife, Environmental Protection Agency and other federal agencies to produce programs on water quality as a component to a program or as a singular theme such as the annual Outdoor Days organized by the US Fish and Wildlife Service and Bureau of Land Management, where over 200 sixth graders participate in water pollution education activities. Finally, DEC presents a lesson on Water Quality Standards, monitoring, and nonpoint source pollution for groups of adult students undergoing training to become wastewater operators in remote locations throughout Alaska. This annual program is sponsored jointly by the EPA and Bureau of Indian Affairs.

Working with 319 Grantees: DEC serves as a state government representative when working with the 319 Grant Awardees projects. We often work through a committee to produce events or educational initiatives that are part of a grant stipulation or another initiative of the grantee. An example of the latter is the 'Scoop the Poop' campaign lead by the Anchorage Waterways Council. This event was formed to encourage the general public to clean up after their pets, as pet waste is considered a major source of fecal coliform bacteria in several Anchorage area impaired streams. Participants from the community range in age from the very young to adults. Vendors from the community as well as groups with a similar interest are also invited to join the event.

Information at Conferences and Fairs: DEC maintains a presence at key State conferences where information about water education and water pollution is distributed to the public at large as well as targeted groups. Annually, DEC participates in the Alaska Forum on the Environment and the Alaska Municipal League Conferences, as well as local and statewide fairs. Information is distributed in several ways; by participating in sessions that actually teach about water pollution issues and opportunities or in a more passive way, through exhibits, brochures, newsletters and fact sheets, as well as demonstrations at the booth. Sessions at the Forum on the Environment include workshops to educate potential grantees about the Alaska Clean Water Actions and the associated grant opportunities as well as Quality Assurance Project Plans. DEC staff informs participants of the priorities of the program as well as assists them in completing an application or submitting water quality information.

A Conduit for Information: DEC provides access to information via its new education website as well as throughout the DEC Water Division webpage. Here, the general public along with all DEC constituents can find information about upcoming programs, curriculums, personnel, data, hot topics including public notices and water related issues as well as access to the education strategy. DEC networks with the Alaska Natural Resource and Outdoor Education Association (ANROE) to distribute information on education best management practices, materials and resources (both human and curricular) and connect with other educators across the country.

For most people, the media is the principal source of current information about environmental issues. Increasingly, the internet is becoming a source of news and events that can be accessed easily. The accuracy, depth and balance of daily news varies substantially but the existing influence and the potential role of the media in influencing attitudes and behavior towards the health of Alaskan waters, is substantial. This is a valuable tool for networking between sectors and other groups. It enables groups to learn what is available in water education.

When public comment is required or requested, DEC issues public notices via the State of Alaska website, publications in applicable newspapers, public hearings, producing public service announcements, holding workshops or open house events to deliver information and receive feedback on topics of interest to Alaskans. Occasionally, we work with other state agencies or across divisions within DEC to produce an event such as the Kenai River Open House, where residents and interested Alaskans could learn about the different programs within DEC that affect the Kenai River.

Supporting Formal Education, Elementary through University: DEC has participated in several school sponsored activities and events. One is the Polaris K-12 Earth Day event. This day long venture provides DEC with access to the grade school students to present information about water pollution. In 2004, we offered information about water monitoring and pH. Students performed hands-on activities to test water and discover the cause of their readings. Students were then tested in an assessment of the activities of the day for which they received a grade for their science class.

DEC served as technical advisor for curriculum for Non-Stop Science events for rural Alaskan schools, led by the University of Alaska, Water and Environmental Research Center. In 2005, DEC will help sponsor a Non-Stop event that relates surface water pollution and run-off to drinking water and community health. This event will occur over a week's time and an entire school will participate with experiments, lessons, art and other assessment techniques. The students will develop ways to communicate the relationship of water pollution and community health to their peers and families. This event supports the Memorandum of Agreement with the University of Alaska to share information and resources. In addition, DEC annually supplies technical support for Wasilla High School ecology class where students monitor and conduct student research projects on high priority (impaired) waters in the Wasilla area.

World Water Monitoring Days: DEC is Alaska's sponsor of the Association of State and Interstate Water Pollution Control Administrator's (ASWIPCA) program, World Water Monitoring Days. This annual event encourages teachers, parents, groups, local governments and the public to focus their attention on local water quality through basic screening or monitoring techniques. Groups monitor

surface waters for pH, turbidity, macro-invertebrates, temperature and dissolved oxygen and enter data into a nationwide database. While the quality control of this information is not to standard, the activity encourages Alaska's population to consider the readings as a snapshot of water quality and further promotes local watershed groups, etc. and their efforts toward stewardship at a local level. DEC provides access to monitoring kits, support for procedures and information about water quality and data translation during this event. We work with other groups to focus on the Clean Water Act and the affects it has had on water quality in Alaska. Some groups and classes now participate annually in this event and have incorporated it into their lesson plans.

CONCLUSION

The advantage of a water pollution education strategy is its ability to help the DEC, Water Division to gauge its progress and growth overtime to reflect current priorities. While DEC does engage in many types activities, there is so much that could be done, for example: Water Fairs, called 'Splash' for an entire community, traveling kits with materials and curriculum, a circulation of media materials or print ads to maintain awareness and involvement in Alaska and many more activities. We must continue to grow our partnerships with other groups and organizations and play a more substantial role in the sponsorship of programs that align with the State's priorities.

In years past, there has been little attention to the accountability of environmental education. As we have seen, this has resulted in funding decreases and a redirection of focus by agencies, schools and other institutions. Educators and those who organize educational opportunities have not worked collectively or effectively in this state. Education has come together in a piecemeal fashion, as educators and program directors have led separate charges all over the state, sometimes overlapping materials or re-inventing the educational wheel. Alaska needs a coordinated effort to create a unified voice for water pollution education. The 'voices' that need to be heard include the Department of Education, on the ground educators-formal and non-formal, program directors from all sectors, naturalists, tour directors as well as industry representatives to list a few. While this may seem like an insurmountable feat, only when we begin to explore what materials are available and create a clearinghouse for the information can we ensure we are providing quality education that will achieve our goal and objectives.

All of these ideas require funding and personnel. As priorities shift, it is our long term goal to continue to find unique and effective methods to reach the audiences of this state and broaden their awareness of the value of water as a resource for all Alaskans.

Appendix B - Information Management System

DEC is committed to develop, build and maintain an information management infrastructure that;

- Provides for efficient storage and retrieval of water quality assessment information of Alaskan waters;
- Improves water quality management decision making and water quality data analysis; Improves the quality and consistency of water quality reporting;
- Reduces the burden of federal Clean Water Act reporting requirements.

Water quality monitoring in Alaska relies upon diverse sources of information and data generated both within DEC and outside the agency. DEC staff network with non-profit and governmental agencies across local, state and federal boundaries, as well as Native entities, volunteer and non-profit organizations. Sources of water quality data and information in Alaska are extensive. The problem is identifying its location, organizing its availability and making it readily accessible, both to the general public, as well as statewide professional resource agency staff in an effort to target limited resources towards the state's highest water resource priorities. ACWA, CIIMS, two STORETs and the Assessment Database together include considerable water quality data to coordinate. A standardized hydrography layer will enhance accuracy and data sharing.

The Alaska Clean Water Actions (ACWA) program and the supporting applications were conceived and designed to:

Support the activities of grant managers responsible for obtaining funding to implement protection or recovery actions for assessed waters by making ranking information available through queries and reports.

- Provide resource agency staff the tools to support an existing, formalized process for targeting limited resources towards the State's highest water resource priorities. The process involves the ranking of waters in Alaska according to their assessed needs for data collection, protection, or recovery actions.
- Streamline the process for identifying waters for consideration under ACWA.
- Provide the ability to query information about waterbodies and rankings to the public over the internet.

Additional DEC management tools used to locate waterbodies statewide rely upon the availability of the National Hydrography Dataset (NHD) and various geographic information system technologies. And an Alaskan data exchange node is under development to expedite the movement of water quality data into STORET from around the state.

ACWA Application

The ACWA application consists of a database and a collection of web-based user interfaces physically hosted at DEC within the State of Alaska network. The system will provide direct links to Legacy STORET and modernized STORET. The ADB database is directly interfaced with ACWA and

waterbodies in ADB and ACWA are synchronized as an on-going routine operation. The general public and organizations outside the State network will access the ACWA application through a public user interface that will be available over the Internet.

Resource agency staff and managers have access to additional interfaces over the Intranet. Information is compiled and shared to analyze and rank individual waterbodies. Processes for evaluating the credibility and sufficiency of information, stewardship effectiveness and assignment of appropriate actions are incorporated, along with a criteria-based ranking system applied across the three State resource agencies responsible for water resource management in Alaska. The system will eventually include a GIS component to support a web-based map browser for Internet users to identify nominations status of waterbodies and query information.

STORET

DEC has adopted modernized STORET (STOrage and RETrival) version 2.0 as the repository for water quality data and water quality monitoring activities conducted within Alaska. STORET is a national U.S. EPA water quality data management system that has been in use since the 1960s and modernized in 1999. STORET is a repository for water quality, biological, and physical data. A copy of the database and associated programs is installed at DEC and contains historical sampling data. Legacy STORET provides access to pre-1999 water quality data for Alaska. ACWA ranking and monitoring staff may query water quality information from STORET to determine if sufficient and credible data exists for ranking and monitoring under ACWA.

Data Entry into STORET

DEC developed standardized electronic data deliverable (EDD) documents to facilitate entry of data into STORET by data generators. The EDD was developed as a standard operating procedure for submission of data collected in support of monitoring plans and applies to grantees, contractors or agency staff directed by DEC to collect water quality data in support of monitoring projects statewide. The EDD is posted on the DEC website at:
http://www.dec.state.ak.us/water/wqsar/storetdocumentation.htm.
The EDD provides a series of options for data providers to manage water quality data and assure that it is reported in a STORET compatible format. These options include:

- MS EXCEL templates designed for organizations to enter their data in a format compatible with STORET Desktop MS ACCESS applications that create STORET compatible export files Desktop STORET and Personal Oracle. The simplest option for DEC is to provide a series of MS EXCEL spreadsheet templates pre-configured to easily allow an organization to enter data in a format readily accepted by STORET.

- DEC participates in the development of MS ACCESS database tools for data generators. The STORET Interface Module for - Data Entry (SIM-DE) and the DASLER-X application are two alternatives nearing final stages of completion that address the need for a simple data entry and water quality data exporting feature that export a STORET compatible format.

- DEC also maintains Personal ORACLE for temporary distribution to organizations responsible for collecting water quality data in fulfilling their grant objectives. With Personal ORACLE, they may elect to run Desktop STORET for data management purposes and reporting in a STORET compatible format.

DEC, in concert with other EPA Region 10 exchange network member states, is designing, developing and implementing a data exchange node in support of the National Environmental Information Exchange Network. Alaska's participation in the consortium includes establishing an actual network node for the purpose of moving water quality data into the national STORET database and sharing this data with members of the consortium.

Assessment Database (ADB)

The ADB, a federal database developed by the EPA, supports the tracking of water quality assessment data, including causes and sources of impairment and use attainment. ADB automates the production of reports that the DEC submits to the EPA using the process defined by section 305(b) of the Clean Water Act. All waterbodies tracked through ACWA are synchronized with ADB to assure that waterbodies represented in ACWA are also represented in ADB. Synchronization also assures that the ACWA waterbody segments are reflected in the ADB and include the appropriate assessment units.

Assessment Database (ADB) & Section 305(b)/303(d) Tracking/Reporting

The Assessment Database (version 2.0) is a relational database application for tracking water quality assessment results and generating reports, particularly useful for Clean Water Act Section 305(b) and 303(d) reporting and listing functions. DEC uses this database for individual waterbodies for which there is assessment information, and reports the status of water quality for these waters and the status of water quality in Alaska on a statewide basis. Assessments that show impairments (e.g., non-supporting uses or persistent exceedances of Water Quality Standards, Section 303(d) listed waters), or assessments that report waters are maintaining and attaining Water Quality Standards, are entered into the database. In addition, the causes (pollutants) and sources of pollution may also be entered into the database. Alaska regularly tracks and reports to EPA on this information, and on many other types of assessment data, for hundreds or thousands of waterbodies within this database. It allows for custom queries enabling the review of data in a variety of ways. The ADB is designed to make this process accurate and straightforward, yet flexible and user-friendly. It also allows Alaska to meet its water quality reporting requirements to EPA under the Clean Water Act.

Reach Indexing Tool

The ADB Reach Indexing Tool will define the geographic regions associated with the waterbodies that are tracked in the ACWA system. The application will provide tools to define geographical regions or segments relative to the National Hydrography Dataset (see below) and correspond to locational segments for ACWA waterbodies. The tool creates appropriate database records with locational information in the ADB database and will share it with the ACWA application.

National Hydrography Dataset (NHD)

The National Hydrographic Dataset (NHD) is a collection of digital line data representing waters throughout the United States. The Alaska Watershed and Stream Hydrography Enhanced Datasets (AWSHED) project is analyzing and incorporating the data representing Alaska waters into the NHD. This work is scheduled to be completed by June, 2005. When completed, the Alaska portion of the NHD will provide a uniform and consistent GIS base layer for water and standard database keys (unique identifiers) representing all streams and lakes in Alaska. NHD will provide underlying spatial information supporting the ADB Reach Indexing Tool described above.

Appendix C - Sources of Funding and Program Assistance

More and more communities are adopting a watershed approach to solving their water quality and other natural resource problems. By considering the inputs from all pollution sources and activities within a hydrologically defined drainage system, managers can understand their watershed on a more holistic level and determine needs for restoring and maintaining the watershed's chemical, physical, and biological integrity. By combining forces and resources, communities, agencies, and interest groups are now better equipped to address local watershed issues.

Communities and local organizations know the types of projects most needed in their area, but they are often unable to implement such projects because of a lack of financial and technical support. With limited funds available and limited discretionary spending, federal, state, and local government programs are rarely able to provide a single primary source of funding. Combined together they can result in environmental progress.

Federal Funding Sources
The EPA Office of Water has developed the Catalog of Federal Funding Sources for Watershed Protection to inform watershed partners of federal monies that might be available to fund a variety of watershed protection projects. This searchable database updates EPA's Catalog of Federal Funding Sources for Watershed Protection (Second Edition) printed in 1999 (EPA 841-B-99-003) and can be found at http://cfpub.epa.gov/fedfund/

This database does not present sources that offer only technical assistance. In addition, it also does not contain information about small, site-specific federal sources or non-federal sources. The information presented reflects sources available as of August 2002. EPA's Office of Water plans to update the Catalog periodically.

The Catalog of Federal Funding Sources for Watershed Protection Web site is a searchable database of financial assistance sources (grants, loans, cost-sharing) available to fund a variety of watershed protection projects. To select funding programs for particular requirements, use either of two searches. One is based on subject matter criteria, and the other is based on words in the title of the funding program. Criteria searches can include the type of organization (e.g., non-profit groups, private landowner, state, business), type of assistance sought (grants or loans), and keywords (e.g., agriculture, wildlife habitat).

The document contains a brief overview and a one-page fact sheet for each of 81 funding sources that inform the reader of the type of projects funded and eligibility requirements. Contacts and Internet sites are provided so the reader can obtain further information. Funding sources by topic include:

Air Quality / Deposition	Outreach / Education
Agriculture	Partnerships
Best Management Practices	Point Source Control
Coastal Waters	Planning
Drinking water	Pollution Prevention
Economic Development	Research

Enforcement/Compliance	Restoration
Fisheries	Solid Waste
Floodplain/Riparian Zones	Source Water Protection
Forests	Stormwater Management
Ground Water	Wastewater
Invasive Species	Water Conservation
Land Acquisition	Watershed Management
Monitoring	Wetlands
Nonpoint Source Control OSDS, RHB, Stormwater	Wildlife Habitat

State Funding Sources for Water Quality and Watershed Activities

Performance Partnership Grant

The primary source of state funding for nonpoint source activities and projects is an annual *Performance Partnership Grant* administered by EPA that combines funding from a variety of sources authorized by the Clean Water Act. These include funding from Section 319 Nonpoint Source Control, Section 106 Water Pollution Control, Section 106 Groundwater Protection, and Section 104(b)(3) grants. The Performance Partnership Grant funds require approximately 40% match from non-federal sources, which comes from both state funding and from local sources. The scope of work performed using funds from the Performance Partnership Grant is negotiated annually with EPA and documented in a *Performance Partnership Agreement*. Funding from the Performance Partnership Grant used to implement the Nonpoint Source Pollution Control Program is allocated into these categories:

- Department of Environmental Conservation water quality programs
- Collaborative projects with the Department of Fish & Game, Department of Natural Resources, and the University of Alaska
- Grants to communities for local watershed protection and restoration projects.
- Municipal Grants and Loans for Water and Sanitation Projects

Municipal Grants

DEC grants to municipalities for public water, wastewater, solid waste, and water quality enhancement projects. Local match requirements depend on a community's population and can include federal funds.

Alaska Clean Water Fund (Revolving Loan Fund)

The Alaska Clean Water Fund and the Alaska Drinking Water Fund provide loans and engineering support for drinking water, wastewater (sewer), solid waste and nonpoint source pollution projects, such as waterbody restoration and recovery. These loan programs are designed for cities, boroughs and qualified private utilities. Our primary services are:

- Providing low-interest loans up to 20 years in duration for projects or eligible portions of projects.
- Providing refinancing of eligible projects.
- Assigning a project engineer to assist with plans, designs, construction and regulations.
- Assuring timely reimbursement for construction expenditures.
- Ensuring appropriate and effective use of loan funds.

Projects funded under the Alaska Clean Water Fund must have identifiable water quality benefits, and only those portions of the project that are water quality related may be funded. Alaska Clean Water Fund can be used for the following types of nonpoint source pollution control projects, further described in the source chapters in the Strategy. Typical nonpoint projects include, but are not limited to:

Rehabilitation of stream bank
Riparian corridors and buffers
Decentralized wastewater systems
Drinking water source protection
Capping and closing out existing landfills and the water quality related portions of new landfills
Street sweepers (leaf/salt removal equipment)
Harbor and dock recycling/waste handling facilities
Correction of groundwater contamination
Remediation of petroleum contamination and
Storm water control (urban, rural and agricultural runoff)
Program Assistance from the Environmental Protection Agency

The Watershed Academy

Public and private organizations, academic institutions, and citizens and their governments in thousands of communities across the nation are forming partnerships and learning new ways to manage their watersheds together. These groups seek guidance and examples of successful watershed approaches, which they may use to model their own activities. The EPA's Office of Water established the Watershed Academy to help address such needs.

The Watershed Academy assists in the protection of water quality on a watershed basis by offering training courses and developing educational materials. Information about the Academy and its services is available on the Internet at http://www.epa.gov/owow/watershed/wacademy/. The Academy offers training courses on watershed processes, functions, and management techniques, and it publicizes watershed-related training programs developed by others. In addition, the Academy provides watershed management facilitation services to help states and tribes implement watershed approaches, offers the Academy 2000 Internet-based training modules, and prepares watershed-related educational documents through its Information Transfer Series.

Watershed Academy Web

EPA has developed an internet-based distance learning program, Academy 2000, to help train people who cannot attend live training courses. Academy 2000 is a set of self-paced training modules that provide a

basic but broad introduction to the many facets of watershed management, organized under the following themes:

Introduction/Overview
Watershed Ecology
Watershed Change
Analysis and Planning
Management Practices
Community/Social/Water Law

Watershed Academy Web now has more than 40 modules available and more under development. These modules cover the most important watershed management topics those subjects about which watershed managers, local officials, involved citizens, decision makers, and others should have at least an introductory level of knowledge. Completing a series of 15 of these modules earns the Academy 2000 watershed-training certificate. (http://www.epa.gov/watertrain/)

Information Transfer Series

EPA's Watershed Academy provides watershed references through the Watershed Academy Information Transfer Series. The documents in the series are available on the Watershed Academy's web site. The Information Transfer Series publications available to date include the following:

1. **After the Storm: A Video Co-Produced by EPA and The Weather Channel** (VHS tape), EPA 840-V-04-001, Office of Water (4503T), U.S. EPA, Washington, DC.

2. **Getting In Step: A Guide for Conducting Watershed Outreach Campaigns** (document), EPA 841-B-03-002, Office of Water (4503T), U.S. EPA, Washington, DC.

3. **Getting In Step: A Video Guide for Conducting Watershed Outreach Campaigns** (VHS tape), EPA 841-V-03-001, Office of Water (4503T), U.S. EPA, Washington, DC.

4. **Watershed Analysis and Management (WAM) Guide for States and Communities**, EPA 841-B-03-007, Office of Water (4503T), U.S. EPA, Washington, DC. Coming soon.

5. **Watershed Training Opportunities**. EPA841-B-98-001, Office of Water (4503T), U. S. EPA, Washington, DC.

6. **Watershed Analysis and Management (WAM) Guide for Tribes** (HTML or ZIP format), Seattle, WA (request from EPA as #EPA 841-B-00-008).

7. **Big Darby Creek Case Study: A Profile of Watershed Threats and Protection in a Midwest Landscape** EPA 841-B-00-004, Office of Water (4503T), U.S. EPA, Washington, DC.

8. **Stream Corridor Restoration: Principles, Processes and Practices**. U.S. Government Printing Office, Washington, DC. (request from EPA as #EPA 841-R-98-900)

9. **Top 10 Watershed Lessons Learned**. EPA840-F-97-001, Office of Water (4501T), U.S. EPA, Washington, DC.

10. **Watershed Approach Framework**. EPA840-S-96-001, Office of Water (4501T), U.S. EPA, Washington, DC.

11. **Monitoring Consortiums: A Cost-Effective Means to Enhancing Watershed Data Collection and Analysis**. EPA841-R-97-006, Office of Water (4503T) U. S. EPA, Washington, DC.

12. **Watershed Protection: A Project Focus**. EPA841-R-95-003, Office of Water (4503T), U. S. EPA, Washington, DC.

13. **Watershed Protection: A Statewide Approach**. EPA841-R-95-004, Office of Water (4503T), U. S. EPA, Washington, DC.

Other Sources of Program and Funding Assistance for Nonpoint Source Pollution

Federal Sources

- **American Heritage Rivers' Catalog of Services** (Source: U.S. Environmental Protection Agency's Office of Water). EPA's American Heritage River Internet site (http://www.epa.gov/rivers/services/) offers a comprehensive listing of services (sources of assistance, helpful documents and guides, etc.) available to those working to improve the health of rivers across the nation.
- **Watershed Information Network** (Source: U.S. Environmental Protection Agency Office of Water) this site provides 89 different sources of financial assistance and guides. (http://yosemite.epa.gov/water/surfah.nsf/financial?OpenView).
- **U.S. Environmental Protection Agency Office of Water) The Targeted Watersheds Grant Program** is a relatively new EPA program designed to encourage successful community-based approaches and management techniques to protect and restore the nation's waters. Watershed organizations receiving grants exhibit strong partnerships with a wide variety of support; creative, socio-economic approaches to water restoration and protection; and explicit monitoring and environmentally-based performance measures. http://www.epa.gov/twg/
- **Beyond SRF: A Workbook for Financing Comprehensive Conservation Management Plans Implementation** (Source: U.S. Environmental Protection Agency's Office of Water, Document No. EPA 842-B-96-002, August 1996). This workbook presents potential approaches for financing coastal protection (in addition to employing the state revolving fund), especially those defined under the National Estuary Program (NEP). Contact the National Service Center for Environmental Publications (NSCEP) at (513) 489-8190/800-490-9198; or fax request (513) 489-8695. (http://sspa.boisestate.edu/efc/Tools&Services/WatershedFunding/watershed_funding_resources.htm)
- **Environmental Finance Program** (EFP). Because we live in times of diminishing resources and competing priorities, the U.S. Environmental Protection Agency has developed the EFP to assist communities in their search for creative approaches to funding environmental projects. Drawing on the financing expertise of staff, the Environmental Financial Advisory Board (EFAB), and

university-based Environmental Finance Centers (EFC), the EFP seeks to lower costs, increase investment, and build capacity by creating partnerships with state and local governments and the private sector to fund environmental needs. The EFC Network can be found at http://www.epa.gov/efinpage/.

- **EPA's State Revolving Fund (SRF) Program** (Office of Wastewater Management, Office of Ground Water and Drinking Water). SRFs are available to fund a wide variety of water quality projects, including all types of nonpoint source, source water protection, and estuary management projects, as well as more traditional municipal wastewater and drinking water treatment projects. Eligible nonpoint source projects include virtually any activity that a state has identified in its nonpoint source management plan. Such activities include projects to control runoff from agricultural land; conservation tillage and other projects to address soil erosion; development of streambank buffer zones; and wetlands protection and restoration. Estuary management projects may include any of the activities above, as well as restocking fish, restoration of wildlife habitat, provision of marine sewage pump-out facilities, and others.
- **Clean Water State Revolving Fund Publications** (CWSRF) documents are available on the Internet at http://www.epa.gov/owmitnet/cwfinance/cwsrf/factsheets.htm

Innovative Use of the CWSRF for Nonpoint Source Pollution (Linked Deposit Pass Through Loans)

Funding Nonpoint Source Activities with the Clean Water State Revolving Fund

Cleaning Up Polluted Runoff with the Clean Water State Revolving Fund

Funding Agricultural Best Management Practices with the Clean Water State Revolving Fund

Funding Estuary Projects Using the Clean Water State Revolving Fund

Protecting Wetlands with the Clean Water State Revolving Fund

Funding Shellfish Restoration and Remediation Projects with the Clean Water State Revolving Fund

Funding Wet Weather Projects with the Clean Water State Revolving Fund

- **Drinking Water State Revolving Fund Publications** (DWSRF). The following DWSRF publications are available on the Internet at http://www.epa.gov/ogwdw/dwsrf.html .
- The Drinking Water State Revolving Fund Program: Financing America's Drinking Water from the Source to the Tap - A Report to Congress (EPA 918-R-03-009, May 2003)
- **SRF Fund Management Handbook** EPA 832-B-01-003, April 2001 (PDF, 792 KB) Drinking Water State Revolving Fund Management Manual (November 1999)
- **Guidance for Tribal Set-Aside SRF Grant Program** (October, 1998)
- Guide to Using EPA's Automated Clearing House for the Drinking Water State Revolving Fund Program (EPA 832-B-98-003, September 1998)
- Drinking Water State Revolving Fund Program Guidelines (November 5, 1998 Federal Register Notice)
- **A Guide to Grants, Fellowships, and Scholarships in International Forestry and Natural**

Resources (Source: U.S. Department of Agriculture's U.S. Forest Service, International Forestry Division, Document No. FS-584, December 1995). This guide, available on the Internet at http://sspa.boisestate.edu/efc/Tools&Services/WatershedFunding/watershed_funding_resources.htm contains a detailed description of grants, fellowships, and scholarships available to university students, scholars, and professionals seeking funding to undertake studies or research in forestry or natural resources.

- **Multi-Objective Management (M.O.M.) Resource Directory** (Source: U.S. Department of the Interior, National Park Service's Rivers, Trails, and Conservation Assistance). M.O.M. is a stand-alone, Windows-based database that contains more than 300 assistance programs offered by private, state, and federal sources. By typing in keywords, the user can locate information about relevant programs. This database is available free of charge from the National Park Service. (http://sspa.boisestate.edu/efc/Tools&Services/WatershedFunding/watershed_funding_resources.htm)
- **National Agricultural Library** (NAL). The NAL (http://www.nal.usda.gov/) is one of four national libraries in the United States. NAL is a major international source for agricultural and related information. Funding resource information is available through two of the NAL's Specialized Information Centers the Water Quality Information Center (WQIC) and the Rural Information Center (RIC). The WQIC offers links to water quality-related funding information.
- **Protecting Sources of Drinking Water: Selected Case Studies in Watershed Management** (Source: U.S. Environmental Protection Agency, Document No. EPA 816-R-98-019, September 1998). This document, available on the Internet at http://www.epa.gov/safewater/swp/cstudy.html, details the experiences of 17 drinking water suppliers funding and implementing source water protection activities.
- **Research and Management Systems** (RAMS). RAMS (http://www.sciencewise.com/) is a federal service for the education and research community, offering software systems for electronic grant management, education opportunities, and research and development information. Services include FEDIX, an online database of federal grant and research opportunities.
- **United States Geological Survey** (USGS). The USGS provides funding for research, water resources data collection, data management, and information transfer activities. USGS program information is available at http://www.usgs.gov/ and also at http://www.cfda.gov/
- **Water Quality: A Catalog of Related Federal Programs** (Source: U.S. General Accounting Office, Document No. GAO/RCED-96-173, June 1996). This catalog briefly describes water quality-related federal programs that offer financial assistance, as well as technical assistance, planning or advisory services, studies, and education. This document is available on the Internet at http://www.gao.gov/AIndexFY96/searchpg.htm

Private, Nonprofit Sources

- Boise State University has developed a web page that hosts links to the following sources of information. See: ***http://sspa.boisestate.edu/efc/Tools&Services/WatershedFunding/watershed_funding_resources.htm***

- **Commission for Environmental Cooperation** (CEC). CEC is a tri-national body (Mexico, Canada, and the United States) created by the environmental side accord to the North American Free Trade Agreement. The CEC created the North American Fund for Environmental Cooperation (NAFEC) to provide funding for community-based environmental projects in North America. Nonprofit, non-governmental organizations are eligible to apply for grants. For more information, see http://www.cec.org/home/index.cfm?varlan=english/.
- **Community of Science** (COS). The COS Funding Opportunities Internet site (*http://www.cos.com*), updated daily, includes information on more than 15,000 grants from around the world.
- **Conservation Technology Support Program** (CTSP). CTSP (http://www.ctsp.org) annually awards grants of equipment plus software to tax-exempt conservation organizations to build their geographic information system (GIS) capacity.
- **Environmental Support Center** (ESC). The goal of ESC's (http://www.envsc.org/) is to improve the U.S. environment by enhancing the health and well-being of local, state, and regional organizations working on environmental issues. ESC offers a Training and Organizational Assistance Program, a Technology Resources Program, a Workplace Solicitation Program, and a new Environmental Loan Fund to help environmental groups become better managed, funded, and equipped.
- **National Center for Small Communities** (NCSC). NCSC (http://natat.org/ncsc/) is a national, nonprofit organization devoted to serving the leaders of America's smaller communities. NCSC provides small town decision-makers with the tools to govern effectively and the skills to expand local economies, protect natural resources, and preserve community character. NCSC offers a series of funding resource publications:
- **National Fish and Wildlife Foundation** (NFWF). NFWF (http://www.nfwf.org), a nonprofit organization established by Congress in 1984, awards challenge grants for natural resource conservation projects. NFWF uses its federally appropriated funds to match private sector funds. NFWF's six priority program areas include wetland conservation, conservation education, fisheries, neotropical migratory bird conservation, conservation policy, and wildlife and habitat.
- **Resources for Global Sustainability** (RGS). RGS offers grant seekers a variety of services, including identification of potential funding, information about colleagues, and custom reports on request. RGS's annual directory, Environmental Grant making Foundations, provides information on more than 800 foundations that fund environmental projects. For more information see the RGS web site (http://www.environmentalgrants.com).
- **River Network**. River Network (http://www.rivernetwork.org) works to protect and restore America's rivers by building the capacity of grassroots organizations and acquiring threatened riverlands. River Network offers publications, fund-raising tips, technical assistance, and the opportunity to network with other groups across the country.
- **Sustainable Community Network** (SCN). SCN (http://www.sustainable.org/) focuses on using innovative strategies to produce communities that are environmentally sound, economically prosperous, and socially equitable. The SCN Internet site offers a variety of information, including funding sources and a comprehensive.

Appendix D - Agencies and Organizations

Department of Environmental Conservation (DEC)
DEC is the lead environmental agency in the state, and has several divisions and programs that deal with managing, protecting, and restoring water quality. A full description of DEC programs can be found on the Internet website at http://www.state.ak.us/dec/. Specific programs relating to water quality are described below.

Division of Water
Program Goals**:** The Division of Water's mission is to improve and protect water quality. In keeping with this mission the division:

- Improve water quality conditions where they are below public health or environmental standards.
- Issue wastewater discharge permits to facilities and operations that release potentially harmful pollutants.
- Ensure facility compliance with permit conditions.
- Provide community assistance with the protection of water quality.
- Develop user friendly public access to water quality data.
- Provide grants, loans and engineering assistance for drinking water, sewerage, and solid waste facilities.
- Provide training programs for and certification of water and sewerage system operators.
- Provide over-the-shoulder and emergency assistance to system operators in remote communities.
- Establishes standards for water cleanliness.
- Regulates discharges to waters and wetlands.
- Monitors and reports on water quality.

Programs within the Division of Water include:

Nonpoint Source Program

Program Goals: To protect water resources and public health from nonpoint sources of pollution

Primary Services:

- Preventing stormwater pollution of water bodies by approving construction site plans.
- Ensuring wetland fills do not adversely affect water quality.
- Reviewing timber harvest plans and performing related field inspections for forestry operations.
- Reviewing construction plans and Storm Water Pollution Prevention Plans for storm water discharges from industrial and construction sites.
- Identifying State water quality priorities and needs.
- Establishing a schedule for developing recovery plans on impaired water bodies.
- Providing pass-through funding and technical assistance to municipalities, local groups and other state agencies involved in water quality projects.
- Responding to public concerns and complaints on local water quality issues.

Water Quality Assessment and Monitoring Program

Program Goals: To provide information and technical assistance for Water Quality Standards, water quality monitoring, information management and data collection in support of environmental and resource management decisions, makers' research of water quality issues.

Primary Services:

- Develop Water Quality Standards that serve as the basis for protecting and improving the quality of the State's waters.
- Provide technical assistance and quality assurance oversight in developing monitoring plans for water quality monitoring.
- Develop and maintain water quality information management systems that provide rapid access to environmental conditions.
- Report on the status and trends of Alaska's marine and freshwaters.

Monitoring Strategy

Program goal: To serve as a framework for Alaska resource agency decisions required for assessing and monitoring Alaska's water resources; to support protection and restoration decisions; and serve as a roadmap for improving state, federal, local, tribal and public capabilities and performance over time for monitoring the status and trends of Alaska's water resources.

Primary Services:

- Monitoring Program Strategy
- Monitoring Objectives
- Monitoring Design
- Core and Supplemental Water Quality Indicators
- Quality Assurance
- Data Management
- Data Analysis/Assessment
- Reporting
- Programmatic Evaluation
- General Support and Infrastructure Analysis

Water Quality Standards

Program Goal: Protect the waters of the state from toxic levels of pollutants.

Primary Services:

- Develop credible and scientifically defensible Water Quality Standards that incorporate state-specific standards.
- Assist the public in using regulations by providing Water Quality Standards guidance and technical assistance to user groups.
- Provide tools to explain and interpret the regulations, such as fact sheets, technical

papers, workbooks, and training opportunities.

- Adopt site-specific water quality criteria when federal criteria are stricter than necessary or not strict enough to protect water uses.

Wastewater Discharge Permits and Certifications

Program Goal: To protect water resources and public health by regulating wastewater discharges.

Primary Services:

- Issue permits and monitor compliance with State permits for wastewater discharges.
- Certify that permit's for wastewater discharges issued by the US Environmental Protection Agency comply with State water quality law.
- Inspect permitted facilities to verify compliance and help operators comply with their permits.
- Cruise ship registration and regulation.
- Improve online permitting and permit fee payment services.

Village Safe Water

Program Goal: Provide grants and engineering assistance to small communities for water, sewer.

Primary Services:

- Provide grants to small communities for water and sewer studies and projects.
- Assign an engineer to each project to assist communities with planning facility design options, address regulatory options, and help manage construction projects.
- Ensure appropriate and effective use of grant funds.

Municipal Water, Sewerage, and Solid Waste Grant Program

Program Goal: Provide partial grants and engineering assistance to larger communities for water, sewer, and solid waste projects.

Primary Services:

- Providing grants for facility planning and construction.
- Assigning a project engineer to assist with plans, designs, construction and regulations.

Municipal Loan Program

Program Goal: Provide loans and engineering assistance to communities for drinking water and wastewater projects.

Primary Services:

- Providing low-interest loans up to 20 years in duration for projects or eligible portions of projects.
- Providing refinancing of eligible projects.
- Assigning a project engineer to assist with plans, designs, construction and regulations.
- Assuring timely reimbursement for construction expenditures.

- Ensuring appropriate and effective use of loan funds.

Division of Environmental Health

Drinking Water Program

Program Goal: To ensure public water systems provide safe drinking water for public consumption that meets minimum federal health-based standards required by the Safe Drinking Water Act
Program Services:

Primary Services:

- Require that public water system owners and operators test drinking water for regulated drinking water contaminants.
- Review contaminant monitoring test results from public water suppliers and specify corrective measures where contamination is indicated.
- Approve new public water systems and modifications to existing ones.
- Regulate minimum health-based standards and procedures for design, construction and operation of Alaska's 1,600 class "A" and "B" public drinking water systems.
- Implement a statewide drinking water compliance strategy to best assist Alaska water systems in providing cost effective safe drinking water.
- Provide information about contaminant monitoring and sampling procedures to public water system owners and operators, third party engineering consultants, and state holders for public water systems.
- Respond to complaints of contaminated or damaged public drinking water wells and impacted watersheds.
- Maintain a statewide database with monitoring, compliance, and enforcement information on public drinking water systems.
- Provide workshops on wellhead protection and source water assessments for communities and public water system owners and operators.

Solid Waste Program

Program Goal: The solid waste program is committed to protecting public health and the environment by ensuring that municipal and industrial landfills and waste collection facilities are properly located based on risk factors, adequately operated, and correctly closed.

Primary Services:

- Prevent improper disposal of solid waste by issuing permits for disposal facilities, including municipal landfills, land spreading of sewage sludge, disposal of contaminated soils, and land disposal of industrial wastes such as oilfield drilling mud.
- Periodically inspect landfills for compliance with permit conditions and regulations.
- Provide practical, hands-on advice to small towns and villages to help them improve community solid waste management.
- Work with owners of closed landfill sites to ensure that actions are taken to prevent contamination and protect public health and the environment.

Pesticide Services Program

Program Goal: To monitor and ensure the proper and safe use of pesticides to prevent adverse effects on human health, wildlife, and the environment.

Primary Services:

- Provide training and certify pesticide applicators.
- Marketplace, Use/Misuse Agricultural Worker Protection inspections.
- Groundwater and endangered species - protection from pesticide.
- Contamination Register pesticides for sale and distribution.
- Agricultural Worker Protection Standard.
- Restricted-Use Pesticide Recordkeeping.
- Proper use, storage and disposal of pesticides.
- Permits for aerial, aquatic, and public pesticide projects

Laboratory Services Program

Program Goal: To provide laboratory testing, certification, and surveillance support for the food, water, soil and veterinary programs of the State of Alaska.

Primary Services:

- Conducts chemical and microbiological sampling of food, water, and soils.
- Certifies commercial and municipal laboratories to conduct analyses of drinking water
- Accredits commercial laboratories to conduct analyses including soil remediation in conjunction with the Contaminated Sites Program.

Division of Spill Prevention and Response

Prevention and Emergency Response Program

Program Goal: The mission of the Prevention and Emergency Response Program is to protect public safety, public health and the environment by preventing and mitigating the effects of oil and hazardous substance releases and ensuring their cleanup through government planning and rapid response.

Primary Services:

- Prevent and reduce the occurrence of oil spills and hazardous substance releases from unregulated sources through education and technical assistance to industry and the public.
- Prevent spills from home heating oil tanks and state unregulated above ground storage/day tanks through the implementation of a targeted public outreach program.

Preparedness

- Improve overall statewide spill response preparedness.
- Expand the Alaska Spill Response Depot/Corp System through formal community spill response agreements with communities and the pre-positioning of response equipment for use by locally trained personnel.
- Update and improve statewide and regional spill response plans.
- Enhance the statewide hazardous materials response capability through meetings, drills and coordinated training, as well as improving local community preparedness.
- Conduct joint training and discharge exercises.
- Develop and maintain response tools such as the Alaska Incident Management System, the Unified and Regional Plans, and common software and standardized terminology among response agencies.
- Improve statewide staff mobilization and logistical support functions to ensure prompt and effective state response.

Response

- Rapidly respond to protect public health and welfare, environment, and natural and cultural resources from the direct or indirect effects of oil and hazardous substance releases.
- Ensure a prompt and adequate cleanup of spills by the responsible parties.
- Apply consistent and measurable cleanup standards.
- Ensure the safety of responders and the public from the effects of spill incidents.
- Assess and cleanup state-led or state-augmented spill responses.
- Assess damages to the environment and ensure natural resources are restored to a safe, healthy, and economically usable state.

Industry Preparedness and Pipeline Program

Program Goal: To protect public safety, human health and the environment by ensuring that producers, transporters and distributors of crude oil and refined oil products and are fully prepared materially and financially to clean up spills and by preventing oil spills and releases from underground storage tank systems.

Primary Services:

- Assist the crude oil and refined oil industry in spill prevention, assuring that they have the personnel, equipment and financial resources to quickly respond to any spill and remediate its environmental damage.
- Provide technical assistance and information to contingency plan applicants and the public on spill prevention and response requirements.
- Review and approve oil discharge prevention and contingency plans required under state law. This includes about 125 plans for oil exploration and production facilities, pipelines, oil terminals and tank farms, tank vessels, and oil barges, and about 240 non-tank vessels (such as cargo vessels, cruise ships, ferries, and railroads).
- Conduct and participate in announced and unannounced spill drills to verify that regulated operators are in compliance with state response planning requirements.

- Inspect regulated facilities and vessels for compliance with state spill prevention and Best Available Technology requirements.
- Review and approve about 700 applications for proof of financial responsibility annually to ensure that regulated operators have the financial resources to carry out oil spill response operations.
- Register oil spill primary response action contractors identified in oil discharge prevention and contingency plans.
- Regulate and provide technical assistance and training to underground storage tank operators and owners for proper tank operation and maintenance and basic spill prevention, including registering, tagging and tracking regulated underground storage tanks and management of third-party tank inspection and worker certification programs.

Contaminated Sites Program

Program Goal: Clean up sites contaminated by past improper disposal or discharges of hazardous substances.

Primary Services:

- Identify and assess sites contaminated with oil or hazardous substances to determine their potential threat to public health and the environment.
- Ensure that contaminated sites undergo investigation and cleanup in a priority order, based on threat.
- Use term contractors to clean up high priority sites that lack a responsible party.
- Recover the state's costs of oversight or cleanup from responsible parties.
- Develop hazardous substance cleanup standards and operating procedures for all phases of contaminated site work.
- Negotiate cooperative funding agreements with federal agencies to enable staff oversight of federal sites.
- Coordinate development of an annual budget proposal to clean up high priority contaminated sites where the state is the responsible party.

Department of Natural Resources (DNR)

DNR is the lead land management agency for the state whose mission is to develop, conserve, and enhance natural resources for present and future Alaskans. DNR's goal is to contribute to Alaska's economic health and quality of life by protecting and maintaining the state's resources, and encouraging wise development of these resources by making them available for public use. The Department of Natural Resources manages all state-owned land, water and natural resources, except for fish and game, on behalf of the people of Alaska. A full description of DNR programs can be found on the Internet website at http://www.dnr.state.ak.us/. Specific programs relating to water quality are found in the Division of Forestry, and the Division of Mining, Land and Water, and are more fully described below.

Division of Forestry

Alaska Forest Resources & Practices Act Implementation

Program Goal**:**
The Act is designed to protect riparian areas from the significant adverse effects of timber harvest activities on fish habitat and water quality, adequately preserve fish habitat by maintaining riparian area characteristics that are important to fish, and prevent or minimize significant adverse effects of soil erosion and mass wasting on water quality and fish habitat.

Primary Services:

- Enforce the state law governing commercial timber operations, including harvesting; road construction, maintenance, and closure; and reforestation.
- Set standards for riparian zone protection through stream buffers, slope stability standards, and best management practices.
- Require a Detailed Plan of Operations from operators on private, municipal, and other public land for interagency review prior to harvesting.
- Prepare a Forest Land Use Plan (FLUP) for proposed timber sales on state land and coordinate interagency review.
- Coordinate interagency review of DPO's and FLUP's for compliance with the Forest Resources and Practices Act.
- Conduct field inspections before or during operations, and before operation closeout. Complete compliance score sheets for active operations.
- Enforce the standards through directives, stop work orders, notices of violations, and civil fines when violations occur.
- Assure that operations on federal land within the coastal zone meet or exceed FRPA standards.

Water Rights Program

Program Goal: Encourage the maximum use of Alaska's water resources consistent with the public interest.

Primary Services:

- Determine and adjudicate water rights.
- Issue temporary water-use authorizations.
- Facilitate the maximum use of the water resources consistent with public interest.
- Provide certainty and security of water property rights.
- Maintain over 16,000 water right records.
- Cooperate with, assist, advise, and coordinate plans with federal, state, local agencies, in matters relating to the appropriation, use, conservation, quality, disposal or control of water.

Alaska Hydrologic Survey

Primary Goals: To provide technical hydrologic information to ensure proper and accurate management of the State's water resources for the benefit of the people of the State of Alaska.

Primary Services:

- Collect, analyze, interpret, and report on all Alaska's ground and surface water resources, including wetlands, glaciers, and coastal waters.
- Provide scientific hydrologic data on the quantity and quality of Alaska's surface and subsurface waters and analysis and interpretation of data collected.
- Provide for review and analysis of data collected by other state, federal, and local agencies and industry.

State Land Use Plans

Primary Goals: Through resource planning, DNR works with the public to determine where the important resources are and how state land can be used for the maximum public benefit.

Primary Services:

Area Plans

- Cover up to 16 million acres of state owned land.
- Establish goals, policies and guidelines for the use of state land.
- Allocate the use of state land including making decisions to: keep or sell land, open or close areas to mineral entry, recommend legislative designations.

Management Plans

- Provide detailed guidance for special areas (like recreation river corridors) or for a specific resource (like forestry).

Office of Project Management and Permitting

The Office of Project Management and Permitting (OPMP) was created [by Executive Order 106] in 2003 in the Commissioner's office of the Department of Natural Resources to act as the lead agency for Large Project Permitting (LPP) and the Alaska Coastal Management Program (ACMP).
A full description of the Office of Project Management and Permitting can be found on the internet at: http://www.alaskacoast.state.ak.us/.

Alaska Coastal Management Program

Program Goals: The state and coastal districts develop coastal management programs that guide land use decisions and protect key resources so that development in coastal areas does not result in an unacceptable level of degradation of coastal uses and resources.

Primary Services:

- Set regulatory standards to maintain or enhance coastal uses and resources.
- Incorporate as standards all of DEC's statutes, regulations, and procedures with respect to the protection of air, land and water quality.
- Coordinate reviews of major development projects in coastal areas.
- Assure that projects are consistent with statewide coastal standards and coastal district enforceable policies.
- Work with local coastal districts to develop state – and federally – approved coastal management programs that include enforceable policies to protect coastal resources and uses.
- Implement the Alaska Coastal Clean Water Plan to protect coastal waters.

Office of Habitat Management and Permitting

The goal of the Office of Habitat Management and Permitting is to protect fish and wildlife habitat and to protect the public use of fish and wildlife resources that depend on this habitat. This is accomplished by reviewing applications and issuing permits for activities affecting fish-bearing waters, and state game refuges, critical habitat areas, and sanctuaries. The Office participates in other land management agencies' permitting and planning activities to ensure that fish and wildlife needs are addressed as required by law.

The Office also works with the natural resource development community to make sure that fish and wildlife populations remain healthy as Alaska develops its mining, oil & gas, forest products, transportation and community-based resources.

Department of Fish and Game (DFG)

The Alaska Department of Fish and Game's mission is to manage, protect, maintain, and improve the fish, game and aquatic plant resources of Alaska. The primary goals are to ensure that Alaska's renewable fish and wildlife resources and their habitats are conserved and managed on the sustained yield principle, and the use and development of these resources are in the best interest of the economy and well-being of the people of the state. A full description of DFG programs can be found on the Internet website at http://www.state.ak.us/local/akpages/FISH.GAME/adfghome.htm. Specific programs relating to water quality are described below.

Division of Sport Fish

Special Areas Designation and Management

The goal of the Special Areas Designation and Management Program is to protect legislatively designated fish and wildlife habitat, which includes refuges, critical habitat areas, and sanctuaries. Special Area regulations may be found at 5 AAC 95.400-900.

Aquatic Resources Program

This program provides aquatic technical support to sustain healthy fish and wildlife production. The goal of this program is to provide departmental coordination, scientific expertise, data collection and analysis needed by the department to make recommendations for maintaining sufficient water quantity and quality and other characteristics of aquatic, riparian, and upland habitats needed for fish and wildlife.

Department of Transportation and Public Facilities (DOTPF)

The mission of the Department is to improve the quality of life for Alaskans by cost effectively providing, operating, and maintaining safe, environmentally sound and reliable transportation systems and public facilities. Special emphasis will be given to using meaningful public involvement and creating working partnerships with other entities. A full description of DOTPF programs can be found on the Internet website at http://www.dot.state.ak.us/. Specific programs relating to water quality are described below.

Statewide Design and Engineering Services

Program Goals: Responsible for the planning, design, construction and maintenance of state owned facilities.

Primary Services:

- Updating erosion and sediment control, and maintenance and operations BMPs to address short-term and long-term water quality associated with storm water runoff (i.e. airports, highways, airports, boat harbors and facilities).
- Developing pollution prevention plans to address water quality associated with storm water runoff from DOT facilities.

University of Alaska

The University of Alaska is comprised of three major campuses and associated regional extended campuses. The University of Alaska Fairbanks, as the nation's northernmost Land, Sea, and Space Grant University and international research center, advances and disseminates knowledge through creative teaching, research, and public service with an emphasis on Alaska, the North and their diverse peoples. The mission of the University of Alaska Anchorage is to participate in the development, dissemination, and application of knowledge through high quality instruction, research, and service to the public. The University of Alaska Southeast Juneau campus offers a variety of degree and certificate programs. Its marine setting lends itself to the study of marine biology and environmental science, while other degree programs in public administration and business administration take advantage of being located in the state capital.

Alaska Cooperative Extension Service

The Alaska Cooperative Extension Service (CES) provides an educational delivery system supported through a partnership between the U.S. Department of Agriculture and the State of Alaska through the University of Alaska Fairbanks, with local Alaska Cooperative Extension offices located throughout the state.

CES delivers university research benefits to all Alaskans through four primary program areas, including land resources, home economics, 4-H/Youth, and community development. Educational program topics range from food and nutrition to Alaska gardening, water quality and arctic construction. CES water quality programs traditionally emphasize watershed stewardship. This program consistently supports statewide public outreach events and provides an educational perspective for state and federal stakeholder groups.

Environment and Natural Resources Institute

The goal of the Environmental and Natural Resources Institute (ENRI) is to provide sound scientific data and analyses without advocacy for use in natural resource and environmental decision making. ENRI also fosters the use of consensus-building techniques to help build agreement on public policy issues related to Alaska's resources.

ENRI provides access to environmental and natural resources information, offers public and contractual information services through several resource information companies, and maintains cooperative links with natural resources libraries and researchers in Alaska, elsewhere in the United States, and in other circumpolar nations. Through networking and the use of database services and resource-sharing products, ENRI can quickly tap into virtually any information source relevant to Alaska.

Marine Advisory Program

The goal of the University of Alaska Marine Advisory Program is to assist in the wise development, utilization, and enjoyment of Alaska's marine resources without detrimental impact on the resources. The program provides a liaison between the University and maritime communities to transfer the problems and needs of the maritime public to researchers and academicians. It provides technical information to harvesters, developers, and users of marine resources, including information on the development of new technologies as well as new applications of existing technologies to marine problems. Other objectives include:

- Developing public awareness of marine resource management and conservation and providing assistance in solving multiple-use conflicts.
- Promoting understanding between marine resource users and marine resource managers.
- Providing information and assistance to coastal communities on problems of coastal stabilization, coastal zone management, and development of port facilities.
- Providing continuing marine safety education to the maritime public; and
- Aiding in the development of marine awareness programs specifically for communities and their schools.

Local Governments

Local governments play a vital role in protecting water quality, especially nonpoint source pollution, which is more readily controlled by local land use laws. Four types cover local governing units in Alaska: Alaska municipal governments, coastal districts, soil and water conservation districts, and tribal governments:

Alaska Municipal Government

Alaska municipal governments are legal entities incorporated under Alaska law to perform both regulatory—i.e. police, zoning, etc., and proprietary—i.e. water, sewer, airport, etc. functions.

- 16 Organized Boroughs and Unified Home Rule Municipalities (perform area wide education, planning/platting/zoning, and tax assessment and collection powers)
- 145 Incorporated Cities (general government powers, public facilities and services, and regulatory powers)

Alaska Soil & Water Conservation Program

Alaska Soil and Water Conservation Districts are a grassroots partnership of local owners, state and federal agencies that work to manage, conserve and develop resources. Districts include:

- Local Soil and Water Conservation Districts (locally designated districts)
- Alaska Conservation District (covers all areas not in a local district)

Tribal/Native Organizations

Native organizations are community-based with close ties to local economies. They have the ability to deliver locally and culturally relevant programs. Significant organizations include:

- Metlakatla Indian Reservation
- Indian Reservation Act (IRA) Tribal Councils

- ANILCA Native Corporations

Non-government Organizations
Non-governmental organizations fill gaps in and complement government agency roles. These groups often represent stakeholders in a watershed process or water quality issue, and are therefore vital for assuring that all of the needs and concerns of a watershed community are addressed.

Public and private nonprofit groups with water quality as a mission take a variety of shapes. Statewide environmental groups, such as Trustees for Alaska or Alaska Conservation Alliance often take on larger, statewide water quality issues. Other groups, such as Cook Inlet Keepers, Southeast Alaska Conservation Council, Northern Alaska Environmental Center, or the Prince William Sound Regional Citizens Advisory Council, take a regional interest in water quality issues most affecting their area. Local groups, such as the Anchorage Waterways Council, Mendenhall Watershed Partnership, or Noyes Slough Action Committee, often spring up as a result of a need or concern in a community that is not being met.

Industry Associations can be found for every major industry in Alaska. Similar to other nonprofit groups, these can be industry-wide in scope, such as the Resource Development Council and Producers Council, or specific to one type of industry, such as the Alaska Oil & Gas Association, Pacific Seafood Processors Association, Alaska Forest Association, Alaska Miner's Association, or Alaska Council on Tourism. While these groups typically advocate for their constituents, they have been known to play significant roles in addressing key water quality issues affecting their industry.

Watershed Partnerships
Watershed partnerships provide a framework that enable citizens and agencies to work together to formulate strategies for protecting watershed resources that address community concerns and that are tailored to the social and cultural context of their area. Agencies recognize that such an approach is necessary in order to achieve the grassroots support and community involvement that are key to successful resource management. Agencies can also better carry out their own regulatory mandates by using the watershed approach and working through watershed partnerships. Several agencies have both separate and overlapping responsibilities under the federal Clean Water Act. For example, coordinating DEC's water quality efforts with the DFG's fish and shellfish habitat protection programs can lead to shared information, integrated plans, and time and cost savings for both agencies.

Federal Agencies
Federal agencies play a variety of roles in protecting water quality, from implementation of the Clean Water Act, to federal oversight of fisheries, wildlife, wetlands, federal lands and forests, coastal zone management, and offshore leasing. Key agencies in Alaska include:

U.S. Environmental Protection Agency (federal manager for air, land, and water quality)
U.S. Fish and Wildlife Service (conserve, protect and enhance fish and wildlife, federal land managers on National Wildlife Refuges)
Army Corps of Engineers (develops and protects water resources and wetlands)
NOAA/National Marine Fisheries Service (fed manager of fisheries and marine habitats)
NOAA/Office of Oceans & Coastal Resource Management (federal coastal zone management)
U.S. Forest Service (federal land managers on national forests)

Bureau of Land Management (federal land managers, oversight on Trans Alaska Pipeline)
Minerals Management Service (federal manager of offshore oil and gas leasing)
Natural Resource Conservation Service (federal land conservation managers)
U.S. Geologic Survey (water quality and hydrologic information to manage the nation's waters)
National Park Service (federal managers on preserve and park lands)
Federal Emergency Management Agency (coordinates and funds cleanup and restoration of impacts from disasters)

Appendix E- ACWA Decision Tree & Ranking Process

February

Introduction & Overview

The Alaska's Clean Water Actions (ACWA) decision tree outlines a process to:

- Determine if waterbodies are adequately protected;
- Identify and prioritize waterbodies-at-risk for additional protection action;
- Identify and prioritize waterbodies needing recovery for restoration or remediation action.

In the **Nomination Phase** individual waterbodies nominated by the public and agencies are reviewed and entered into the ACWA database (or returned to the nominator for additional information).

In the **Analysis Phase** each waterbody is analyzed to determine:

- Whether existing stewardship programs are adequate to maintain and protect the waterbody;
- Whether available data is sufficient to determine the existence or extent of a current or potential problem.

The **Analysis Phase** directs waterbodies to three possible actions or outputs:

- Waterbodies that are adequately protected;
- Waterbodies requiring additional data;
- Waterbodies that require additional protection or recovery.

Waterbodies-at-risk and waterbodies needing recovery, are addressed in the **Action Phase** by:

- Prioritizing individual waterbodies for action;
- Identifying and implementing protection or recovery actions;
- Evaluating the success of protection/recovery actions and directing the waterbody for additional information, continued monitoring or additional protection/recovery actions.

During all phases, additional data needs may be identified, sending the waterbody to the data collection track.

ACWA Decision Tree

The ACWA decision tree diagrams the flow of information, pathways and critical decision points for the application of key criteria associated with a decision. The diagram is read left-to-right. Common objects are color-coded to simplify and help organize understanding.
http://www.dec.state.ak.us/water/acwa/acwa_decision_tree_diagram.tif

Each object in the ACWA Decision Tree diagram is identified with an alpha-numeric character(s) near the upper part of the object. The alpha-numeric identifier is keyed to additional narrative description that further characterizes the object's purpose or function. In this document, references to a Decision Tree object will be alpha-numerically referenced in parentheses ( ) following the descriptive reference.

The ACWA Decision Tree is segmented top-to-bottom, using alphabetical-only designators, into three primary tracks:

- Data Collection & Monitoring Track (D.)
- Stewardship Implementation Track (E.)
- Assessment Track (F.)

The Assessment Track (F.) is further segmented horizontally, left-to-right, into three different phases, as:

- Nomination Phase (A.)
- Analysis Phase (B.)
- Action Phase (C.)

The ACWA Decision Tree process starts in the Assessment Track (F.) and Nomination Phase (A.) with the Waterbody Nomination (1). End results yield three sets of ranked waterbodies and one set of unranked waterbodies, each requiring a unique set of stewardship action(s). The ranked waterbodies are categorized as:

- Data Collection & Monitoring (5A)
- Waterbodies At Risk (8A)
- Waterbody Recovery (9A)

A fourth set of unranked waterbodies residing in the Stewardship Track also results, categorized as:

- Adequately Protected Waterbodies (15A)

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Appendix F- Boat Operation Local Ordinances

Municipal Nonpoint Source Pollution Ordinances to address
Harbors & Marinas

46. Manage boating activities where necessary to decrease turbidity and physical destruction of shallow water habitat.

16 ordinances are available.

Municipality	Ordinance Title	Number	Applicability to Management Measure
Bethel	Unlawful acts.	14.10.050	*Illegal to operate boat within small boat harbor exceeding posted speed limit or to cause a wake or wave action.*
Homer	Vessel Speed Limits.	10.08.210	*Section a. Prohibits operating vessel at speed greater than 2 mph (no wake speed) while entering, leaving, and inside Small Boat Harbor. Prohibits operation of vessel at speed causing wake, wash, or wave action within .25 mile of no wake zone.*
Juneau	Prohibited Acts	85.25.090	*Prohibits boat operation at speed in excess of five nautical miles per hour or at speed which causes wake in excess of six inches in height.*
Juneau	Speed limits.	85.25.095	*Restricts speed of boat or aircraft in area within 250 feet of port at speed in excess of five nautical miles per hour, when there are commercial boats over 150 feet in length and regularly engaged in transport of persons.*
Ketchikan	Prohibited activities.	14.20.110	*(Page 5) (d) Prohibits operation of boat that causes a wake or wave action which will damage, endanger or be likely to endanger any other boat or any of the boat harbor facilities.*

Kodiak	Operation of vessels.	18.28.190	*Section e. establishes 5 mph speed limit in channel and 3 mph speed limit in small boat harbors. Prohibits operation of vessel within waterway at speed causing wake, wash, or wave action which may cause damage.*
Matanuska-Susitna Borough	LIMITATION OF MOTORIZED USES ON DESIGNATED LAKES AND WATERWAYS.	17.58.100	*(C) No-wake zone. Prohibits speeds in excess of 5 m.p.h. on designated lakes/waterways extending horizontal distance of 100 ft. into water from shoreline. May be extended to protect unusually sensitive wildlife habitat.*
Petersburg	Conduct in harbor facility--Rules generally.	14.20.130	*G. Restricts movement of vessels within moorage areas to mooring and entering/leaving area only. Enforces speed limits within Harbor Facility.*
Petersburg	Fees for prohibited acts.	14.20.380	*D. Assesses $25.00 fee for speeding or excessive wake violation.*
Seward	Speeding.	7.10.510.	*Prohibits operating vessel in manner which causes excessive wake, wash, or wave action which will damage, endanger, or cause undue distress to other vessel or occupant.*
Sitka	Speed limits.	13.12.035	*Prohibits operating vessel at speed producing wake, wash, or wave action which may damage any other vessels or harbor facilities or create discomfort to occupant by causing boats to yaw, pitch, shear or heave because of such wake, wash or wave.*
Unalaska	UNLAWFUL ACTS.	18.12.050 (A)(1)	*Prohibits operation of vessel, boat or skiff within a restricted waterway at speed in excess of 10 knots (11.5 MPH), or at speed which produces wake, wash or wave action could*

			damage other vessel or port facility .
Valdez	Violations and prohibited acts generally.	Section 11.04.160	*A.1. Prohibits operation of vessels within Valdez Small Boat Harbor limits in excess of three miles per hour or at such speed as to leave a wake, wash or wave action that can cause damage.*
Valdez	Aircraft in Valdez Small Boat Harbor.	Section 11.04.200	*Prohibits aircraft from landing or takeoff within Valdez Small Boat Harbor or entrance area between breakwaters, including aircraft operation in excess of three miles per hour, or at speed which may leave a wake, wash or wave action that can damage.*
Whittier	Prohibited acts.	12.04.160 B.	*B. Prohibits operation of boats within boat harbor facilities that exceed posted speed limit or cause wake or wave action which will damage.*
Wrangell	Speeding.	14.09.005	*Click link for Chapter 14.09 Prohibited Practices. 14.09.005 Speeding, prohibits operation of vessel within the harbor in excess of three (3) miles per hour or in a manner which causes an excessive wave.*

Appendix G- Local Ordinances on Urban Nonpoint Source Pollution

Local Ordinances Relating to Urban Nonpoint Source Pollution

The local ordinances in Alaska that relate to the fifteen management measures (17-31) that address urban nonpoint source pollution may be accessed through the table, below. Each ordinance is identified by municipality, ordinance title and reference number. Many Alaskan municipalities have codes of ordinances which are available online. Whenever possible, a direct link is provided to the local ordinance online. Otherwise, the ordinance text is available in PDF (Adobe Acrobat) format.

	Federal Management Measures/Pollution Controls	
View Ordinances	17	Manage runoff from new development so that post-development TSS loadings after construction are reduced and post-development peak run-off rate and average volume are close to pre-development levels.
View Ordinances	18	Protect watersheds, minimize land disturbance, retain natural drainage features and vegetation, protect sensitive areas.
View Ordinances	19	Do comprehensive planning on a watershed basis.
View Ordinances	20	Sediment and erosion from construction sites less than 5 acres.
View Ordinances	21	Application, generation and mitigation of petrochemicals, pesticides, nutrients, and toxins from construction sites less than 5 acres.
View Ordinances	22	Reduction of pollution from existing development.
View Ordinances	23	Disposal or recycling of household hazardous wastes and pet wastes; use of fertilizers and pesticides on lawns and gardens; pollution from gas stations and parking lots.
View Ordinances	24	Planning and siting roads and highways away from sensitive areas or areas that are susceptible to erosion; limiting land and vegetation disturbing activities during road construction.
View Ordinances	25	Siting, design and maintenance of roads, highways, and bridges.
View Ordinances	26	Controlling erosion and sediment during and after road, highway and bridge construction.
View Ordinances	27	Controlling toxic spills and hazardous waste at equipment and fuel storage sites at road, highway and bridge construction sites.
View Ordinances	28	Controlling pollutants caused by the operation and maintenance of roads, highways, and bridges.
View Ordinances	29	Retrofitting roads, highways, and bridges to collect nonpoint source pollutants.

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[1] Stormwater ordinances in Anchorage are referenced through this table but are exempt from the Section 6217 program due to the NPDES Phase I stormwater permit for the Anchorage Municipality.

Appendix H- Examples of water quality-related research and effectiveness monitoring of the FRPA and Regulations

1. Relevant Literature For an Evaluation of The Effectiveness of The Alaska Forest Resources And Practices Act: An Annotated Bibliography (Robert A. Ott, Ph.D, Angie K. Ambourn, M.S, Fabian Keirn, Alison E. Arians, Ph.D).
This effort was funded by the Alaska Coastal Management Program, Department of Natural Resources, pursuant to National Oceanic and Atmospheric Administration Award No NA17OZ2325. The intent of this annotated bibliography was to identify projects throughout Alaska that address the effectiveness of the current Alaska Forest Resources and Practices Act (FRPA) in protecting fish habitat and water quality. The Act requires protection of ten components:

A.) channel morphology,
B.) clean spawning gravels,
C.) food sources,
D.) large woody debris,
E.) nutrient cycling,
F.) stream bank stability,
G.) stream flow,
H.) sunlight,
I.) water quality,
J.) water temperature.

Very little research has been conducted specifically to evaluate the effectiveness of FRPA. Therefore, this review takes a broader approach and identifies projects that contribute to knowledge of the ten fish habitat and water quality components and the impact of forest management practices on these components. The literature search was expanded beyond Alaskan projects to provide additional information contributing to a general understanding of aquatic ecosystems and the impacts of forest management upon them. This document can be found at:

http://www.dnr.state.ak.us/forestry/pdfs/05effmonr1.pdf

2. Martin, D.J., M.E. Robinson, S.J. Perkins, and R.A. Grotefendt. 1997. Monitoring the effects of timber harvest activities on fish habitat in streams of coastal Alaska 1992- 1997. Project status report written by Martin Environmental, and S.J. Perkins, Seattle, Washington, and Grotefendt Photogrammetric Service, Inc., North Bend, Washington. Written for Sealaska Corporation, Juneau, Alaska. 13pp.

Sealaska Corporation and the Alaska Forest Association initiated a monitoring program in 1992 to determine the short-term and long-term effects of modern forest practices on fish habitat and water quality. This report provides a summary of the monitoring program objectives, approach, and findings from 1992-1997.

The objectives of the monitoring program were to: (1) determine if fish habitat conditions have been altered by timber harvest; (2) determine if habitat quality has been significantly affected, positively or negatively, by timber harvest; and (3) identify specific types of BMPs, such as riparian buffers or roads, that are not protecting fish habitat. Stream surveys were conducted from 1992 to 1997 in 32 basins located in coastal forests of southeast Alaska, on the Kenai Peninsula, and on Afognak Island. In order to determine if fish habitat conditions have changed due to timber harvest, two study approaches were used: (1) comparing pre- and post-harvest habitat conditions in multiple basins, and (2) comparing pre and post-harvest habitat conditions in each of the basins. Conclusions are presented for the buffer zone and mass wasting studies.

3. Martin Environmental. 1997. A summary of stream water quality monitoring data: South Fork Michael Creek, Admiralty Island, Alaska. Draft report written by Martin Environmental, Seattle, Washington. Written for Koncor Forest Products, Inc., Anchorage, Alaska, and the Alaska Department of Environmental Conservation and Alaska Department of Natural Resources, Juneau, Alaska. 10pp.

The South Fork of Michael Creek in the Lake Florence Watershed, Admiralty Island was monitored from 1993-1996 to determine the effect of 66 ft wide riparian buffer strips with variation treatments on water temperature and turbidity. The stream was monitored for two years prior to timber harvest, and continued during the logging phase (1995 and 1996). Stream stage, turbidity, and water temperature were monitored at five stations, and riparian canopy density was measured between stream monitoring stations. The partial-cut buffers and associated BMPs effectively maintained stream turbidity near pre-harvest levels. Pretreatment canopy densities were not measured, but comparisons of canopy densities among treated and untreated areas suggested some places were affected by timber harvest. Canopy density was reduced in all sampled areas in the winter of 1995-1996 as a result of blow-down. The effectiveness of the partial-harvest buffers and associated BMPs on maintenance of water temperature was not clearly demonstrated.